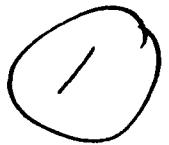# AD-A225 118

PUBLIC-PRIVATE VENTURES
IN BACHELOR QUARTERS

A Solution to the Loss
of Military Construction Projects

Volume 2: Appendices A through E

Report NA705R2

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June 1990

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The Navy has a substantial requirement for new bachelor quarters (BQs) during a time of austere budgets for military construction. Public/private ventures (P/PVs) may offer an alternative. With a P/PV, a private company would finance, design, build, operate, and maintain a new BQ facility at its own risk of profit or loss. This report examines the feasibility of P/PVs, and how they should be structured, using five test sites, and presents example requests for proposals. P/PV BQs for enlisted and officer transient personnel and for junior enlisted permanent party personnel offer a less costly alternative to BQs built and operated with conventional Government funding. Factors affecting economic feasibility of a P/PV BQ include project size, occupancy guarantees, interest rates, contract term, construction specifications, and Government statutory and regulatory restrictions. Occupancy guarantees are particularly important. With a reasonable occupancy rate guarantee, the contractor can charge much lower room rates. We recommend that the Navy pursue P/PVs and accelerate its internal P/PV planning and procurement process. The Navy should assume more risk by guaranteeing occupancy rates where warranted by demand for lodging. The Navy should also request DoD to develop an economic justification methodology specifically for P/PVs.

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PREFACE

This is Volume 2 of a four-volume report; this volume consists of Appendices A through E. Volume 1 describes the findings, conclusions, and recommendations of our study of public/private ventures in the construction and operation of bachelor quarters for Navy enlisted and officer personnel.

Volume 3 presents Appendices F, G, and H, and Volume 4 presents Appendices I through L.

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APPENDIX A

RESULTS OF FIRST REQUEST FOR PROPOSALS

PREFACE

Appendix A consists of comments on the request for proposals (RFP) issued for the bachelor officers quarters construction at Newport, Rhode Island, and New London, Connecticut. Unlike the other Appendices (B through L) it has not been previously published.

RESULTS OF FIRST REQUEST FOR PROPOSALS

On 12 May 1989, the Northern Division, Naval Facilities Engineering Command issued its first request for proposals (RFP) for a public/private venture (P/PV) bachelor officers' quarters (BOQ). That RFP required the successful offeror to construct two 150-room BOQs, one at Naval Education and Training Center, Newport, Rhode Island, and the other at Naval Submarine Base, New London, Connecticut. This appendix presents lessons learned from that RFP so that future P/PVs can benefit from them.

Chalet Susse International, Inc. (CSI), of Wilton, New Hampshire, was the successful offeror. It has designated the HAR Group to design and construct the two BOQ facilities. The HAR Group was officially established in 1988 with more than 20 years of construction behind it. It originated as the construction division of CSI, building the first Susse Chalet Motor Lodge in 1967. Since then, it has been designing and constructing high quality, cost-efficient buildings for CSI.

CSI now owns and operates more than 40 hotel/motel properties in the Northeast and mid-Atlantic states. HAR Group can draw on the resources of CSI to support its design and construction efforts. The CSI in-house staff is experienced in working with local site engineers, town and local zoning and planning agencies, and state and Federal authorities. The CSI purchasing department handles the purchase of construction materials, furniture, equipment, and operating supplies for CSI's properties.

We solicited comments from CSI on the solicitation, documentation, requirements, and process and present CSI responses in this appendix.

- *Occupancy guarantee:* CSI would not have bid on the project in the absence of an occupancy guarantee which was essential for obtaining financing. The 75 percent guarantee fit well with the room rate cap of $45.00 per room per night. If the occupancy guarantee had been 90 percent, CSI would have bid room rates 6 to 8 percent lower.

- *Packaging:* CSI prefers P/PV packages of at least two BOQ facilities but would be interested in a single BOQ if it is in the northeast region of the

United States. A package of three or four BOQs would be needed to entice CSI to bid outside of its region.

- *Financing:* Numerous questions were posed by the financial institutions such as:

  ▶ What happens if the base closes?

  ▶ What happens if Congress does not appropriate funds?

  ▶ Why was no Termination for Convenience of the Government clause included in the contract?

  Also, some lenders had a problem with the method of collecting payment directly from the occupants instead of directly from the Government. The construction loan is a conventional loan while the long-term financing will be financed with bonds.

- *Contract term:* The resulting P/PV contract has a 32-year contract term; CSI would have accepted a contract with a 25-year term with two 5-year options. A 32-year term coincides with the useful life of the facility (according to the IRS tax code).

- *Construction payment and performance bonds:* CSI's interpretation of the bonding requirement was that the general contractor was to provide payment and performance bonds to the owner. In CSI's case, this would mean the HAR Group would provide bonds to CSI; this requirement does not make sense since HAR Group and CSI are the same company. CSI has offered to provide a completion bond to the Navy, which is the same as a performance bond except that the language pertaining to contract payments will be eliminated since the Navy is making no payments.

- *Base closure:* CSI stated that it is not concerned about a base closure because of the 75 percent occupancy guarantee. Pursuant to that term the Navy would be obligated to pay for 75 percent of the rooms even if the base was closed. CSI is also assuming that if the base was closed, its contract would probably be bought out as part of the cost of a base closure.

- *Restoration bond:* CSI was not able to obtain the restoration bond required by the contract. It stated that this item is not a normal instrument that is provided by the surety industry; Lloyds of London is probably the only company that would be willing to provide the restoration bond that the Navy requested. CSI stated that to fulfill this requirement, they may have to invest $100,000 in a Treasury Department T-Bill and provide it to the Navy in lieu of the restoration bond. CSI also offered (and would prefer) to establish an escrow account in lieu of the restoration bond; this would be of benefit to the Navy since these funds would be spent on the BOQ facilities at Newport and New London. CSI does not usually establish maintenance

escrow accounts for its facilities because it pays for maintenance and rehabilitations out of its working capital.

- *Construction schedule:* The time allowed in the contract for the design and completion of the facilities was generous. CSI can design and build the required facilities in a fraction of the time allowed; however, CSI did submit a schedule that utilizes the full time allowed by the contract. That schedule protects CSI from any delays that may arise from unforeseen conditions or problems.

- *Marshall's Valuation Service:* CSI was able to meet the requirements of Marshall's specifications. It could not think of another way to specify quality without voluminous quantities of specifications.

- *Proposal preparation:* Preparation of a proposal in response to the RFP required an inordinate amount of effort (i.e., hundreds of man-hours were required). Developers without a computer-aided design (CAD) system and/or in-house design capabilities probably would not have bid on this RFP. RFPs need to be simpler (e.g., they should not require detailed electrical and site utilities drawings).

- *Taxes:* CSI expects to pay all Federal, state, and local taxes and included those costs in its pro forma calculations.

- *Site data:* Site plans, utility plans, and geotechnical data were important to the preparation of accurate construction cost estimates. For the New London site, CSI would not have been able to bid without the soil borings and geotechnical studies that were provided. If CSI had commissioned its own geotechnical study, the results would not have been available in time to bid on the RFP.

- *Maintenance standards:* CSI had no problem with the maintenance standards specified (i.e., the "unoccupiable room" concept). CSI's maintenance standards exceed those of the Navy, and it would take a room out of service before being told to by the Navy.

- *Other authorized users:* CSI did not consider adding any rooms to the BOQ for other authorized users. Two factors contributed to this decision: (1) the occupancy guarantee only applies to authorized users; therefore, obtaining financing for the extra rooms would have been difficult since the P/PV concept is new and (2) the sites limited the size of the facilities that could be constructed; 150-room BOQs were pushing the limits of the sites.

- *Davis-Bacon Act:* If Davis-Bacon prevailing wages had been required by the contract, the P/PV BOQs would not have been feasible within the room rate ceiling of $45.00 per room per night. At least 15 to 20 percent would have been added to the bid if the Davis-Bacon Act had applied.

APPENDIX B

FEDERAL-PRIVATE PARTNERSHIP OPPORTUNITIES FOR BACHELOR HOUSING: AN ECONOMIC ANALYSIS

PREFACE

Appendix B was originally published separately as a temporary LMI report with a restricted distribution. We have reprinted it here with no changes. Thus, material in the original document or appended to it bears the same numbering and designation it did when previously published.

FEDERAL-PRIVATE PARTNERSHIP OPPORTUNITIES FOR BACHELOR HOUSING: AN ECONOMIC ANALYSIS

Report NA702TR1

June 1987

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CONTENTS

CHAPTER 1

INTRODUCTION

The Navy has a substantial requirement for new bachelor housing facilities to replace many substandard and aging facilities and to meet the needs for new facilities required by the Strategic Homeporting Program. Because Military Construction (MILCON) funds are limited, the prospects for full funding of all these requirements are not good. In fact, two Bachelor Officer's Quarters (BOQ) projects were cut by the Congress from the FY87 program and the Navy was directed to investigate the possibility of alternative financing for them. That specific directive and the probability that other projects will be cut in future programs have led the Navy to investigate the feasibility of private sector financing, construction, operation, and maintenance of bachelor housing facilities. Recent legislative initiatives such as P.L. 98–115 (Sec. 801), and Title 10 USC (Sec. 2667 and Sec. 2809) provide several different opportunities for Federal-private partnerships.

This study investigates those partnership opportunities and develops a decision process to evaluate the various alternatives. In this first phase of the study, we selected two test sites as case studies for formulating the decision factors and structuring an economic analysis model. Our preliminary conclusions and recommendations on Federal-private partnership arrangements for BOQs at those sites and for bachelor housing in general are presented in Chapter 2. The two sites, New London, Conn., and Newport, R.I., are described in Chapter 3 along with the basic facility requirements and options. Additional sites, including Bachelor Enlisted Quarters (BEQs), will be evaluated in the second phase as part of the validation and fine-tuning of the model. For those additional sites, we will evaluate several alternative approaches that take into consideration local requirements and conditions. We will then perform a detailed economic analysis to evaluate the feasibility of the approaches and determine which is optimal for each specific location. In addition, we will prepare draft solicitations [requests for proposals (RFPs)] and will assist in structuring final working agreements between the Navy and the private sector. Finally, we will develop a guidebook to assist Navy personnel in evaluating other potential sites.

The concept of having the private sector finance military construction is a promising one. Such financing is currently being used by a number of state and local governments to provide various kinds of facilities and services, and DoD has used it successfully for family housing, food services, and utilities. The basic concept in private sector financing is for a private firm to finance, construct, own, maintain, and operate a facility providing services to a military base. Costs are recovered through user charges and/or lease payments depending on the specifics of the agreement. The facility may be located on either a military installation or private land depending on the military requirements and availability of the land. In either case, the private builder retains ownership of the building. These agreements are long-term — currently 20 to 25 years — and initiatives have been made to extend them over 30 years.

All of the Military Departments have shown interest in using Federal-private partnerships for BOQ-type operations. The Air Force has developed two projects for transient officer quarters, and the Army has recently awarded a contract for construction of a temporary living facility for soldiers who are transferring. Our analysis of those projects and initial discussions with the hotel industry representatives present an encouraging picture for the feasibility of privately financed BOQs. The analysis in Chapter 4 highlights the key economic and policy issues in structuring a successful partnership, presents the initial economic model, and discusses the model's function and operation.

CHAPTER 2

CONCLUSIONS AND RECOMMENDATIONS

A Federal-private partnership for BOQs at New London and Newport is economically feasible. Certain factors make the arrangement cheaper to the Government, and certain factors must be present to attract private developers. The factors that make the arrangement cheaper to the Government are, in order of importance:

- Room size (square footage)

- Bond-financing rather than conventional financing

- Allowance of rental to other authorized users

- On-base as opposed to off-base location.

The factors that should or must be present from the standpoint of private developers are:

- Minimum lease or occupancy guarantee

- Thirty-two year contract term

- Use of local building codes rather than military construction specifications

- Reasonable and predictable formula for calculating lease payments during the contract term

- Allowance of rental to other authorized users.

Our discussions with Pannell, Kerr and Foster, Inc. (PKF), a national Certified Public Accounting and management consulting firm, indicated further that food and beverage operations are typically only marginally profitable at budget hotels. Based upon the industry average food and beverage expenditures that are necessary for such an operation to break even in the private sector, we concluded that BOQ food and beverage revenues would not be sufficient to warrant a privately owned and operated food and beverage facility within the BOQ.

Private industry contacts indicated that the larger (i.e., regional and national) hotel/motel developers would not be particularly interested in one-at-a-time contracts for constructing, owning, and operating BOQs, given the relatively small number of rooms involved. Those larger developers are the ones who are most able to put together the financing and other arrangements necessary to make a Federal-private partnership in BOQs work. We obtained some information from developers that indicated "regional packages" of construction projects would provide the incentive for the larger firms to become interested for the long term.

For several reasons, we estimate that the private sector can build, own, operate, repair, and maintain BOQs cheaper than the Government. One reason is that private sector design and construction costs are lower. The private sector does not custom design each new facility; private developers have standard designs they can easily modify for BOQ site and square footage requirements. Another reason is that the private sector uses standard industry construction techniques and local building codes. Our analysis of these techniques shows that private sector standards differ from NAVFAC standards in only a few characteristics (e.g., the private sector does not provide a duplicate back-up heating system nor fallout shelter capabilities). Other reasons are related to operations and maintenance costs, which the private sector has efficiently honed in order to have well maintained and run facilities but remain competitive and profitable in the industry. The Navy has the opportunity to take advantage of all of these factors with private sector-financed BOQs.

Based on our economic analyses and other findings, we recommend that the Navy take the following actions:

- Draft a single RFP for New London and Newport BOQs.

- Submit the draft RFP for review by appropriate groups within the Navy.

- Based on feedback from those groups, produce a second draft RFP to be discussed with the industry, possibly at an industry forum.

- Include the following characteristics in the draft RFP:

  ‣ On-base location.

  ‣ Guaranteed minimum lease payment.

  ‣ Thirty-two year contract term.

- ▸ No food or beverage requirement.

- ▸ Industry standard room size.

- ▸ Use of standard industry construction, including local construction codes.

- Continue to explore third-party BOQs at additional sites.

CHAPTER 3

TEST SITES, FACILITY REQUIREMENTS, AND OPTIONS

SITE DESCRIPTION

In the first phase of the study, we selected two test sites to serve as case studies for developing decision factors and structuring the generic economic analysis model. Both sites, New London and Newport, were designated as having a high-priority need for additional bachelor officers quarters. This chapter describes the sites and the facility requirements of each.

Naval Submarine Base, New London

The Naval Submarine Base at New London serves as training center for the U.S. Navy's Submarine Fleet. Existing BOQ facilities provide adequate billeting for up to 381 officers, with another 105 spaces classified as substandard. The BOQ requirement at New London is to have adequate housing for the 716 officers who are either assigned duty to the base or are officer students at the various submarine schools. The existing shortfall of officers' billeting, compounded by overlapping class scheduling, contributes an annual cost of approximately $8 million in nonavailability allowances. Proposed MILCON for the base in FY87 was for construction of a new 157-room BOQ facility and demolition of one substandard building, with the total construction cost for the facility estimated at $10.6 million. (MILCON funds for additional BOQ construction are planned for FY88 and following years.) The specific siting of the New London facility requires high costs – estimated at $1.7 million – for site preparation because of slope and rock formations. Limited space and poor terrain severely restrict the selection of alternative on-base sites.

Using New London as a test site gives us the opportunity to examine the feasibility of private sector BOQ financing in a special situation. The relatively large costs for special site preparation were also included in the private sector estimates to make the MILCON/private sector comparison economically realistic. Therefore, New London is a "worst-case" scenario for private sector costs; if a

Federal-private partnership proves economically feasible at New London, it should also be economically feasible elsewhere.

Naval Education and Training Center, Newport

The primary mission of the Naval Education and Training Center (NETC) at Newport is to meet the training needs of students, including among others those attending Officers' Candidate School, Surface Warfare Officers School, and Officer Ship Material Readiness courses. Under existing conditions, sufficient Government quarters are not available to meet billeting requirements. The BOQs there provide adequate billeting for 194 personnel, with an additional 220 spaces classified as substandard. The Training Center at Newport requires accommodations for 1,074 officers. That shortage of available spaces contributes to a cost to the Government of approximately $2 million a year in issued nonavailability per-diem. FY87 MILCON funding was for construction of a new BOQ with 150 rooms to provide for a portion of the required housing for officers attending training schools at NETC Newport. (MILCON funds for additional BOQ construction at Newport are also planned for FY88 and following years.) Total MILCON cost for constructing the new facility is estimated at $9.8 million. Along with the planned site, several alternative sites were identified as being available.

FACILITIES REQUIREMENTS AND OPTIONS

We developed an economic analysis model to compare life-cycle costs to the Government for various BOQ options at a generic naval installation. To test that model, we have applied it to analysis of the BOQ requirements for 150 units at Newport and 157 units at New London. We also examined some specific options outside of the computer version of the model that are not restricted to new construction. The options considered include:

- On base.
  - ▸ Build a MILCON BOQ.
  - ▸ Have a contractor build, own, and operate a BOQ.
  - ▸ Have one contractor build and operate two BOQs to serve both New London and Newport.

- Off base.

  ▶ Have a contractor build, own, and operate a BOQ.

  ▶ Have one contractor build and operate two BOQs to serve both New London and Newport.

  ▶ Contract for the lease and operation of an existing hotel. (This option has not yet been fully considered; however, preliminary analysis indicates that its cost would be higher than the others. It is not discussed further at this time.)

In each of the contractor options, we assumed that design and construction would meet prevailing industry standards, which do not always match the requirements of the NAVFAC DM-36 series design manuals. Although basic requirements such as room size, construction materials, and noise attenuation compare favorably, the private sector does not orient siting for possible future solar heating, nor does it consider use of the structure as a fallout shelter, both of which are DM-36 series requirements. Furthermore, the model does not restrict construction to three stories as required by NAVFAC DM-36.1, and this will have to be a local input if size is, in fact, restricted by flying operations or other considerations. The New London MILCON option, for example, was for a seven-story structure.

The standards and costs of the private sector construction were taken from the *Marshall Commercial Service* (formerly, the *Marshall Valuation Service*), the generally accepted source within the hotel industry. We chose a general standard that provides fire-resistant construction, reinforced concrete columns and beams, concrete or concrete on steel deck flooring, face brick, carpeting, highly decorated public rooms, and good lighting and plumbing. The square footage allowed for each type of unit is summarized in Table 3-1. These Marshall standards are commonly used and understood within the industry, and their use, together with a minimum of additional design constraints, should not only encourage more contract offers but allow more innovation at a lower cost.

The New London MILCON option calls for steel columns and beams because of the special site conditions, and that requirement was carried over to the private sector cost options. Such special requirements will have to be local inputs to the otherwise general economic analysis model.

TABLE 3-1

GROSS SQUARE FOOTAGE BY UNIT TYPE

Type	Square footage	Notes
Officers (03 & above)	650	1
Officers (02 & below)	475	1, 3
Officers (transient)	425	2

Notes:

1   NAVFAC DM-36.3, Table 1, gives gross square footage for officer living quarters.

2.   Transient officers were allowed the same area as 02 & below, less 50 square feet since they will not have kitchens.

3.   New London BOQ square footage was programmed above allowance at 495 square feet.

Permanent and transient personnel are both considered in our analysis. To serve both, a facility must have separate units since transient officers are not authorized kitchens and permanent residents may object to sharing a floor with transients.

The contractor may be given the option of renting rooms to transient military-related personnel not normally authorized BOQ or Visiting Officer Quarter (VOQ) space. These transient personnel include family members attending school graduations, contractors visiting the base, military retirees, and geographic bachelors (i.e., assigned officers whose families are temporarily living elsewhere). Space for these personnel was accounted for separately in the model since its construction and operation would be entirely a matter for the contractor to finance. It is useful to consider this option because any profits from this additional space may make the total concept more attractive to prospective contractors.

The gross square footage allowances for each type of unit in Table 3-1 do not include a restaurant. That option, if it is to be included, is costed separately in the model.

CHAPTER 4

ECONOMIC ANALYSIS MODEL FOR BACHELOR HOUSING

INTRODUCTION

The success of the private sector financing approach hinges primarily on its economic viability. (Other factors necessary for a complete successful package are discussed at the end of this chapter.) The financing approach must be economically attractive to both the Government and the private builder, or neither will be interested in undertaking it. The economic viability depends on the answer to the question, *"Is the private sector willing and able to finance, construct, own, maintain, and operate bachelor housing at a lower price than the cost to the Government to provide similar facilities and services?"* This chapter provides a methodology that the Navy can use to answer that question.

We developed a general computer-assisted model for performing economic analyses of individual bachelor housing projects. The model accounts for all life-cycle costs for both MILCON and similar private sector-provided bachelor housing facilities and can be used for analyzing a wide variety of proposed projects.

The model uses data for the specific MILCON project (i.e., from DD Form 1391 — Military Construction Project Data), assumptions about Navy bachelor housing policies, and private sector cost guidelines to determine the probable economic viability of a given project. The effects of changes in Navy policies and other factors on economic viability can be quickly and easily simulated.

Pannell, Kerr and Forster (PKF), one of the nation's leaders in performing economic feasibility studies of proposed projects for the hotel/motel industry, assisted in the model development. Financial institutions usually require independent economic feasibility studies by firms such as PKF before committing funds to a developer. Thus, PKF maintains a national data base on industry operations and is experienced in constructing economic feasibility models for specific private sector projects. Logistics Management Institute (LMI) relied heavily on PKF's analysis and recommendations in developing the private sector cost portions of the model.

The model is consistent with Office of Management and Budget (OMB) Circular A-104 guidelines for buy-versus-lease Government cost comparisons. In some situations, the A-104 analysis may not be an appropriate methodology; we have noted those instances in this chapter.

STRUCTURE OF THE ECONOMIC MODEL

The model can be used to analyze the total life-cycle costs of proposed bachelor housing projects for both MILCON and private sector construction. Life-cycle costs are defined to include all project costs: design, land, site preparation, construction, furnishings and fixtures, financing, maintenance, repair, operations, management, and profit (for the private sector case). With only a few exceptions (e.g., design), all MILCON project cost items are known by the Navy project planner and are used as fixed inputs in the model. The remaining MILCON costs are estimated by the model (e.g., design costs as a percentage of estimated construction costs) according to Navy criteria.

The determination of a methodology to estimate private sector costs entailed a more complex process. Jointly with PKF, we modified standard industry pro forma financial statements to show all relevant line-item costs for Navy bachelor housing. These line items became the basis for developing cost estimating relationships (CERs) for each line-item cost of bachelor housing.

From discussions with the Navy and PKF, we determined that bachelor officer housing most resembles "budget" hotel operation in private industry. Budget hotels are characterized by efficient-sized rooms, economy-grade furniture and fixtures, no swimming pool or other similar amenities, and a small restaurant (or no restaurant). Standard industry costs for budget hotels with approximately 150 units were, therefore, the starting point for developing cost estimating relationships.

Industry operations costs (both fixed and variable) are usually calculated or estimated on the basis of available rooms or occupied rooms. We adjusted the industry line-item costs to reflect standard Navy operations. For example, private industry provides linen service every night, whereas the Navy provides that service weekly for bachelor officers. We examined each line-item cost in this manner, making adjustments where appropriate and, from that examination, developed industry-based parameters for estimating private sector operations costs on a line-item basis. The model currently assumes linearity in operations costs, which is

realistic for projects of about 150 units. We are working with PKF to determine economy-of-scale-in-operations parameters for significantly larger facilities.

Industry design and construction costs are typically estimated utilizing a published reference source such as the *Marshall Commercial Service*. Such sources give the estimated total delivered costs, including design, site development, and construction costs, for a given class structure such as a budget hotel. These cost estimates are given in terms of gross square footage, including hallways and common areas. Adjustment factors to account for regional differences in site development and construction costs are also published and were used in the model for the two test sites. Standard industry costs for furniture and fixtures were utilized with replacement assumed to occur every 5 years.

Calculation of life-cycle costs requires the estimation of the stream-of-cash outlays over the anticipated life of the project. For example, furniture and fixtures are assumed to be replaced every 5 years, whereas operations costs occur every year. DoD inflation factors are utilized for this purpose.

Similarly, an accurate economic comparison of alternative project options requires that the stream-of-cash outlays be discounted to a net present value (NPV). DoD discount factors are used in the model for making NPV calculations.

The economic model uses LOTUS 1-2-3™ software, and thus, it can be used on any IBM-compatible personal computer. LMI will provide copies of the model and a user's manual to the Navy at the conclusion of the project.

ECONOMIC DECISION FACTORS

An objective of this study is to identify key decision factors that determine the economic and operational viability of Federal-private partnerships in bachelor housing. We tentatively identified five key economic decision factors: minimum occupancy/minimum lease payment guarantees, financing method, length of contract term, ability to rent to other users, and land costs. This section discusses their importance, and the next section analyzes their quantitative impact on the economic viability of the two test sites.

Minimum Occupancy and Lease Payment Guarantees

The private sector must be guaranteed minimum occupancy or minimum lease payment for bachelor housing. Bachelor housing is unlike many other potential military investment opportunities for the private sector. With fast food restaurants, for example, private sector capital investment in the facility is minimal compared with the annual generation of revenues and, consequently, the structure can be paid off in several years. Bachelor housing, on the other hand, is capital-intensive, and several decades of lease payments may be needed to pay for the investment in the physical facilities. Private developers cannot get financing for such large capital projects unless they can demonstrate a reasonable ability to generate the revenues needed to service the debt over the expected life of the asset. A developer who builds a hotel in the private sector has control over the potential market. That is, the developer is free to rent rooms to whomever he can attract through advertising or other means. In the bachelor housing case, however, a developer does not have control over the market; he is solely dependent on the Navy and its operations at the base. Neither does the developer have the option of converting the facility to an alternative use if revenues are insufficient. Not surprisingly, therefore, financial backers insist on some assurance that the stream of revenues sufficient to cover expenses and service the debt will be forthcoming over the life of the contract with the Navy. Conceptually, that assurance should not present a problem for economically viable lease alternatives since the private sector's costs (including profit) would be less than the cost to the Government of the MILCON option. The Navy has authority under certain sections of various appropriation acts to enter into long-term lease arrangements; however, the question becomes whether these existing authorities are sufficient to satisfy the requirements of private sector financial backers.

Financing Method

The second economic decision factor, financing method, is intertwined with the first. Conventional financing typically requires a 25 percent down paymen', with payback over the life of the asset (or life of the contract) at a rate of interest determined by the market for loans of this type at the time of settlement (currently 11 to 12 percent). Investors require a return on their investment (ROI) that is at least equal to their next best alternative use of the funds. This "opportunity cost" is the minimum profit that a private sector developer would be willing to accept, over

and above operations costs and debt service, to participate in a Federal-private partnership for bachelor housing. The industry standard for this minimum ROI is 15 percent before income taxes. The bottom line is that both the interest on the loan (11 to 12 percent) and the 15 percent ROI on the cash up front are costs of doing business to the prospective developer and affect the economic viability of proposed projects. We included them in the model as costs.

Bond financing is an alternative approach for a developer. With bond financing, 100 percent of the construction costs can be borrowed. If the Navy gives a private developer a minimum lease payment or minimum occupancy guarantee, that developer has a guaranteed cash stream that he can sell by issuing bonds against this future stream of lease payments. He will be able to obtain an AA or AAA bond rating, which translates into a lower rate of interest, possibly only 7 or 8 percent. Since no cash down payment is required, no ROI needs to be paid to the developer; he takes a standard 3 percent of gross rents as a management fee. Therefore, if sufficient minimum lease payments or occupancy rates are guaranteed by the Navy, the economic viability of a given bachelor housing project increases significantly.

Contract Term

The length of the contract term is another important economic decision factor. The facilities may have little or no alternative use for the private developer at the end of the contract term since the Navy's presence may be substantially lessened or altered compared to current operations. Therefore, a private developer must finance and amortize the facilities for the length of the contract or the asset's useful life, whichever is shorter. The useful life of such a facility is about 32 years according to the new depreciation schedules in the Tax Reform Act of 1986. If the Navy (or the Congress) insists that a contract cannot exceed 20 years, then debt service payments are significantly higher. Furthermore, in that event, the contractor would only be able to depreciate about five-eighths of the building for tax purposes during the contract term and at the end of the 20 years, the building may have no alternative use to the contractor or it may revert to the Navy. Therefore, a contractor would want a contract period that coincides with the minimum allowable asset life for tax depreciation purposes. The 1987 House/Senate Armed Service Committees Conference Report language suggests a limit of 20 to 25 years; however, based on this rationale, the Army recently requested an exception from the House Armed

Services Committee for its Temporary Living Facility (TLF) at Fort Drum, N.Y., for a contract term of 32 years. The request was granted.

Ability to Rent to Others

The ability of the private sector operator to rent unoccupied rooms to other persons may be an important economic decision factor. Every base has several groups of "other" persons who may want to rent unoccupied BOQ rooms. Among these groups are geographic bachelors, civilian defense contractors, retired military, reservists, and others such as relatives of Navy personnel stationed at the base. If one or more of these groups are classified as "other authorized users" of the facility under the contract, the private developer may be able to generate additional revenues beyond the minimum lease guarantee. If this market is sizeable, the contractor may be willing to accept a lower minimum lease payment guarantee, thereby saving the Government money. Such a clause for "other authorized users" was included in the Army TLF contract at Fort Drum and was determined to be important to the agreement.

Land Costs

The cost of land is another important economic decision factor. If the facility is built off base and the contractor has to purchase the land, the cost of the land becomes part of the initial capital costs along with design, construction, furniture, fixtures, and other initial items. Inclusion of land raises the capital costs that have to be financed, increasing both debt service and ROI costs. Needless to say, the higher the cost of land, the less likely the economic viability of a Federal-private partnership for bachelor housing. The analysis presented in OMB Circular A-104 requires a relatively large appreciation of the land and attributes that value to the private sector, raising the private sector NPV cost to the Government and working against the selection of a private contractor option.

If BOQ facilities are built on base, title should revert to the Government at the end of the lease term. Industry sources indicated to LMI that even if the facilities were built on severable land at the edge of the base, it would be extremely difficult to estimate their economic value 20 to 30 years hence. A private developer, therefore, would not be willing to accept a substantially lower annual lease payment in exchange for permanent ownership of facilities on land for which no reliable

estimate of future value can be made. Again, the analysis in OMB Circular A-104 restricts the private sector option by attributing a significant value to the building.

Off-base construction may be viewed differently by developers since land and facilities away from the base have greater possibilities for alternative use after the contract term. The future value of off-base land can be better estimated (at least in terms of increasing or decreasing) than on-base land. Therefore, although off-base options are more expensive to the Government, they may be more attractive to developers.

ANALYSIS OF NEW LONDON AND NEWPORT OPTIONS

We utilized data for planned BOQ's at New London and Newport to test the economic model. The six options shown in Table 4-1 were analyzed at each site and compared to the MILCON option. These options are the most relevant for the purposes of illustrating the usefulness of the model in identifying the key factors that will determine the economic viability of a project. The model is capable of simulating dozens of options for a single project.

We selected these options to test the sensitivity of the model results to important factors in the Federal-private partnership. Among those factors were the use of MILCON square footages versus Navy minimums for off-base construction, 11 percent conventional loans versus 8 percent bond financing, and rental to other authorized users.

The model results using the options shown in Table 4-1 for New London and Newport are shown in Tables 4-2 and 4-3, respectively, along with the MILCON estimated cost. The dollars shown in those tables are the NPVs of the *costs to the Government* for each option. Those costs include operations, maintenance, repairs, debt service, and return on investment; they represent the model's estimates of the minimum price that a private developer would charge the Government to enter into an agreement. The tables also show the percentage of the MILCON cost option for each of the options we identifie'. The lower percentages represent lower costs to the Government; private developers would receive the same relative rate of return under any option.

The tables show that for both sites, the bond financing option (Option 5) is the most economically viable. Bond financing and Navy minimum square footages have

TABLE 4-1

MODEL OPTIONS FOR BACHELOR OFFICERS QUARTERS AT NEW LONDON AND NEWPORT

Option #	Location	Size	Other users	Financing
1	On base	MILCON	None	11% conventional
2	On base	Navy minimum	None	11% conventional
3	On base	Navy minimum	2 rooms	11% conventional
4	On base	Navy minimum	5 rooms	11% conventional
5	On base	Navy minimum	5 rooms	8% bond
6	Off base	MILCON	None	11% conventional

Note: All options are for a 32-year contract term.

TABLE 4-2

COMPARISON OF MILCON AND ESTIMATED PRIVATE SECTOR COSTS (NPV) FOR BACHELOR OFFICERS QUARTERS SUBMARINE BASE, NEW LONDON

	MILCON	Option 1 On-base	Option 2 On-base	Option 3 On-base	Option 4 On-base	Option 5 On-base	Option 6 Off-base
Total cost NPV	$23.583.848	$23.370.241	$21.904.007	$22.143.981	$22.431.949	$20.563.770	$22.729.776
Total revenue NPV (from other authorized users)	$0	$0	$0	$532.021	$1.170.446	$1.170.446	$974.530
Total adjusted NPV	$23.583.848	$23.370.241	$21.904.007	$21.611.960	$21.261.503	$19.393.324	$21.755.246
% of MILCON NPV		99%	93%	92%	90%	82%	92%

TABLE 4-3

COMPARISON OF MILCON AND ESTIMATED PRIVATE SECTOR COSTS (NPV) FOR BACHELOR OFFICERS QUARTERS SUBMARINE BASE, NEWPORT

	MILCON	Option 1 On-base	Option 2 On-base	Option 3 On-base	Option 4 On-base	Option 5 On-base	Option 6 Off-base
Total cost NPV	$24.799.569	$24.135.202	$19.850.681	$20.085.111	$20.366.427	$18.864.574	NA
Total revenue NPV (from other authorized users)	$0	$0	$0	$531.756	$1.169.863	$1.169.863	
Total adjusted NPV	$24.799.569	$4.135.202	$19.850.681	$19.553.355	$19.196.564	$17.694.711	
% of MILCON NPV		97%	80%	79%	77%	71%	

an estimated NPV cost to the Government of 82 percent of the cost of the MILCON option at New London, and 71 percent of the MILCON option at Newport. Conversely, Option 1, 11 percent conventional financing and MILCON project square footages, is not viable at New London (99 percent of the MILCON NPV) nor at Newport (97 percent of the MILCON NPV). If the private sector is allowed to use the Navy minimum square footages (Options 2 – 5) instead of the larger MILCON-proposed square footages, economic viability of a Federal-private partnership increases substantially; in Option 2, NPV drops to 93 percent of the MILCON NPV at New London and to 80 percent at Newport.

Options 3, 4, and 5 offer interesting possibilities for both the Navy and the private sector. They allow the private contractor to build a few additional rooms beyond the MILCON requirement and rent them to other authorized users. Allowing construction and rental of these few extra rooms to other authorized users yields significant results. Assuming a $30 room per night charge and rental of an average of two rooms per night (Option 3), the NPV percentage is reduced to 92 percent of the MILCON option at New London and to 79 percent at Newport; rental of five rooms a night reduces the percentages to 90 and 77 for New London and Newport, respectively. If the bond financing assumption is used in the five-room option rather than the 11 percent conventional financing, the NPVs are even lower (Option 5), further increasing the economic attractiveness of the arrangement to both the Government and the contractor. Two to five rooms per night is a reasonable and conservative assumption since it represents less than 5 percent of the average number of such authorized persons estimated to need lodging at any given time at New London and Newport.

As noted before, the off-base option does not appear to be feasible. In the case of New London, the off-base option NPV (Option 6) is 92 percent of the MILCON option because of the cost of purchasing and financing the necessary land and the associated property taxes.

Many more options could be run, applying various combinations of assumptions about interest rates, method of financing, number of rooms rented to other authorized users, etc. However, the cost estimates shown in Tables 4-2 and 4-3 amply illustrate the sensitivity of the results to the factors that are important in making a Federal-private partnership in bachelor officer housing work.

OTHER DECISION FACTORS

Several other factors, primarily related to Navy policy, will likely be important in making decisions affecting a successful business agreement for a Federal-private partnership in bachelor officer housing. Those other factors are intertwined with the economic decision factors to some degree and are discussed in this section. In the following discussion, we do not assign a relative degree of importance to the factors.

The Navy must address the issue of allowing rental of unoccupied rooms to other authorized users, preferably on a Service-wide basis. That issue will probably have to be addressed within the overall context of the relationship between third-party BOQs and Navy Lodges. Some of the other authorized users may be persons who could, or would, otherwise stay at a Navy Lodge if they did not stay off base. The Navy Military Personnel Command should establish a policy in this area.

Room size is another issue in which Navy, and possibly DoD, policy should be examined. Under the MILCON projects, rooms proposed for New London and Newport are larger than the Navy minimum requirement, with attendant cost implications. Further, while the Navy minimum square footage exceeds that used as a standard by the hotel industry, the Navy furnishes the room with only one double bed while the hotel industry furnishes theirs with two double beds; the industry has also developed very efficient bedroom, bathroom, and closet designs. We recommend that the Navy study the hotel industry standard room designs in the overall context of examining its policy on room size. If the Navy determines the hotel industry's standard room designs and sizes are adequate for BOQs, further cost savings will be realized.

Off-base options pose unique issues. If officers are forced to live in off-base BOQs, would the Navy be obligated to provide free transportation to and from the base? If the answer is yes, would that service be provided by the contractor or by the Government? Furthermore, since the Navy does not currently have the necessary statutory authority to provide such transportation, it would have to seek legislative authority. The cost estimate for the off-base option (Option 6 in Tables 4-2 and 4-3) includes these transportation costs, which are relatively minor compared to the overall size of total annual operating costs for a BOQ.

Scheduling of classes at Navy schools is another issue that must be addressed before attempting a third-party agreement. The submarine school at New London

overlaps most of its classes by 1 or 2 weeks. The school has a policy of allowing officers to stay off base on per diem for the entire 3-month school time if quarters are not available on base at the outset. Thus, some suitable housing is unused for periods of time. The Navy should reexamine these kinds of school scheduling policies, for if they continue, the Navy could end up paying for a partially used third-party BOQ under a guaranteed minimum lease while officers are on per diem off base.

Economic viability according to NPVs notwithstanding, the Navy will have to determine the specific lease payment formula and methods that it wishes to use. The estimates generated by the model are the total of debt service, profit, and operations costs over the life of the contract, discounted back to the present. Since a one-time up-front lease payment from the Government to the contractor equal to the estimated NPV is not realistic, a formula for annual lease payments will have to be derived. For example, a formula that approximates the NPV estimate is to pay a fixed annual amount for debt service and ROI, and an operations and maintenance amount that is tied to actual costs and/or inflation. PKF has indicated that industry developers would not be interested in a payment formula that was not fairly predictable, that is, they would not want to be at the mercy of changing attitudes on the part of the Government each year. Another option would be to have a single lease payment, either fixed or variable, whose actuarially estimated cash stream is acceptable to both the developer and the Government; the single amount could be part of the contractor's proposal.

Finally, various guarantees will need to be part of any agreement. In particular, the Navy will likely need to guarantee some minimum lease payment or level of occupancy for the life of the agreement. We believe this should not be a problem based on our interpretation of the several authorities the Navy has at its disposal for engaging in third-party contracts for living quarters, provided the NPV of the cumulative lease payments over the life of the contract is less than 95 percent of the MILCON option.

APPENDIX A

LIFE-CYCLE COSTING ASSUMPTIONS

APPENDIX A

LIFE-CYCLE COSTING ASSUMPTIONS

Construction Cost. The total project construction cost for building, supporting facilities and site improvements, contingency, Supervision, Inspection, and Overhead (SIOH), and design costs.

Residual Land Value. The inflated end-of-term residual value plus 1.5 percent annual appreciation.

Maintenance Costs. Annual cost of property maintenance adjusted for inflation plus 1 percent annual increase.

Equipment Costs. Equipment costs cover tangible personal property for room furnishings. Full replacement is estimated at 5-year intervals with costs adjusted for inflation.

Operations Costs. The sum of the annual costs for maintenance, utilities, real estate and property taxes, total room-related expenses, total undistributed expenses, building contents, and liability insurance costs adjusted for inflation. Real estate and property taxes have an additional increase of 1 percent per year above inflation.

Utilities Costs. Annual costs for energy, water, and sewer expenses adjusted for inflation.

Annual Profit on Equity. The annual return on investment (ROI) on 25 percent of the total construction and land costs at an assumed fair rate of return of 15 percent.

Building Residual Value. The end-of-term building value adjusted for inflation minus 1.7 percent annual depreciation.

Real Estate and Property Taxes. Annual cost of taxes adjusted for inflation plus 1 percent annual increase.

Total Annual Costs. The annual sum of operation costs, annual profit on equity, equipment replacement costs, and annual debt service.

APPENDIX B

PRO FORMA FINANCIAL STATEMENTS AND
COST COMPARISON SUMMARIES

CONTENTS

ON-BASE   NAVFAC BACHELOR HOUSING ANALYSIS MODEL

24-Jun

PLANNED FACILITY	MILCON OPTION	OPTION1 ON-BASE	OPTION2 ON-BASE	OPTION3 ON-BASE	OPTION4 ON-BASE	OPTION5 ON-BASE
Installation	NEW LONDON	NEW LONDON	NEW LONDON	NEW LONDON	NEW LONDON	NEW LONDON
Total Number of Rooms	157	157	157	159	162	162
Transient Officers	157	157	157	157	157	157
Permanent Party Officers	0	0	0	0	0	0
Enlisted1 (E1-4)	0	0	0	0	0	0
Enlisted2 (E5-above)	0	0	0	0	0	0
Other Authorized Users	0	0	0	2	5	5
Assumed Occupancy Rate	100%	100%	100%	100%	100%	100%
Size, SF	77720	77715	66725	67773	69030	69030
Total Construction Cost	$10,704,590	$7,527,055	$6,688,518	$6,777,352	$6,883,954	$6,883,954
Starting Fiscal Year	1987	1987	1987	1987	1987	1987
Discount Rate	8.70%	8.70%	8.70%	8.70%	8.70%	8.70%

COST COMPARISON SUMMARY	MILCON	OPTION1 ON-BASE	OPTION2 ON-BASE	OPTION3 ON-BASE	OPTION4 ON-BASE	OPTION5 ON-BASE
24-Jun						
TOTAL COST NPV	$23,583,848	$23,370,241	$21,904,007	$22,143,981	$22,431,949	$20,563,770
TOTAL REVENUE NPV (from other authorized users)	$0	$0	$0	$532,021	$1,170,446	$1,170,446
TOTAL ADJUSTED NPV	$23,583,848	$23,370,241	$21,904,007	$21,611,959	$21,261,502	$19,393,323
% of MILCON NPV		99%	93%	92%	90%	82%
ANNUAL RENT	$2,015,227	$1,996,975	$1,871,666	$1,892,191	$1,916,798	$1,757,163
LESS ANNUAL REVENUES (from other authorized users)	$0	$0	$0	$45,461	$100,014	$100,014
ANNUAL ADJUSTED RENT	$2,015,227	$1,996,975	$1,871,666	$1,846,730	$1,816,784	$1,657,149

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	MILCON	OPTION1 ON-BASE	OPTION2 ON-BASE	OPTION3 ON-BASE	OPTION4 ON-BASE	OPTION5 ON-BASE
Percentage of Occupancy	100%	100%	100.0%	100.0%	100.0%	100.0%
Average Daily Room Rate	$30	$30	$30	$30	$30	$30
Revenues						
Rooms	$1,719,150	$1,719,150	$1,719,150	$1,755,150	$1,798,350	$1,798,350
Food	$0	$0	$0	$0	$0	$0
Beverage	$0	$0	$0	$0	$0	$0
Coin Laundry	$0	$14,326	$14,326	$14,551	$14,821	$14,821
Other Vending	$0	$9,169	$9,169	$9,313	$9,486	$9,486
Total	$1,719,150	$1,742,645	$1,742,645	$1,779,014	$1,822,657	$1,822,657
Departmental Expenses						
Rooms						
Total Payroll and Related Expenses	$0	$226,750	$226,750	$226,750	$226,750	$226,750
Transportation	$0	$0	$0	$0	$0	$0
Linen	$3,684	$3,684	$3,684	$3,685	$3,686	$3,686
Operating Supplies	$27,506	$7,450	$7,450	$7,607	$7,707	$7,707
Laundry and Dry Cleaning	$0	$9,685	$9,685	$9,837	$10,019	$10,019
Other	$51,575	$13,753	$13,753	$13,969	$14,228	$14,228
	$82,765	$261,321	$261,321	$261,807	$262,391	$262,391
Food and Beverage	$0	$0	$0	$0	$0	$0
Total Departmental Expenses	$82,765	$261,321	$261,321	$261,807	$262,391	$262,391
Total Operated Departmental Income	$1,636,385	$1,481,324	$1,481,324	$1,517,207	$1,560,266	$1,560,266
Undistributed Operating Expenses						
Total Payroll and Related Expenses	$314,504	$132,625	$132,625	$132,625	$132,625	$132,625
Administrative and General	$9,734	$46,158	$46,158	$46,883	$47,753	$47,753
Basic Management Fee	$0	$0	$0	$0	$0	$54,680
Property Operation and Maintenance	$48,513	$48,513	$48,513	$49,275	$50,189	$50,189
Laundry Maintenance	$1,099	$1,099	$1,099	$1,116	$1,137	$1,137
Energy	$133,450	$133,450	$133,450	$135,546	$138,061	$138,061
Total	$507,300	$361,845	$361,845	$365,445	$369,765	$424,445

	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6
Income Before Fixed Charges	$1,129,085	$1,119,479	$1,119,479	$1,151,762	$1,190,501	$1,135,821
Fixed Charges						
Real Estate and Property Taxes	$166,875	$173,292	$151,239	$153,575	$156,379	$156,379
Building and Contents Insurance	$40,035	$40,035	$40,035	$40,664	$41,418	$41,418
Ground Rent	$0	$1,200	$1,200	$1,200	$1,200	$1,200
Total	$206,910	$214,527	$192,474	$195,439	$198,997	$198,997
Income Before Other Fixed Charges	$922,175	$904,952	$927,005	$956,323	$991,504	$936,824
Income Available for Debt Service	$922,175	$904,952	$927,005	$956,323	$991,504	$936,824
Model Outputs for Construction Costs						
Land Costs	$0	$0	$0	$0	$0	$0
Building Cost	$5,680,000	$5,929,655	$5,091,118	$5,171,076	$5,267,026	$5,267,026
Support and Site Cost	$2,870,000	$938,000	$938,000	$938,000	$938,000	$938,000
Design Cost	$568,276	$0	$0	$0	$0	$0
Contingency (5.0%)	$427,500	$0	$0	$0	$0	$0
SIOH (5.5%)	$493,763	$0	$0	$0	$0	$0
Tangible Personal Property	$665,052	$659,400	$659,400	$668,277	$678,929	$678,929
	$10,704,590	$7,527,055	$6,688,518	$6,777,352	$6,883,954	$6,883,954
Debt Principal	$0	$5,645,291	$5,016,388	$5,083,014	$5,162,966	$6,883,954
Annual Return on Investment	$0	$262,265	$250,819	$254,151	$258,148	$0
Annual Debt Service	$0	$643,808	$572,085	$579,684	$588,802	$602,007
Profit (Loss) Before Taxes	$922,175	$543,409	$605,739	$630,790	$660,851	$334,817

24-Jun

PLANNED FACILITY	MILCON OPTION	OPTION1 ON-BASE	OPTION2 ON-BASE	OPTION3 ON-BASE	OPTION4 ON-BASE	OPTION5 ON-BASE
Installation	NEWPORT	NEWPORT	NEWPORT	NEWPORT	NEWPORT	NEWPORT
Total Number of Rooms	150	150	150	152	155	155
Transient Officers	150	150	150	150	150	150
Permanent Party Officers	0	0	0	0	0	0
Enlisted1 (E1-4)	0	0	0	0	0	0
Enlisted2 (E5-above)	0	0	0	2	5	5
Other Authorized Users	0	0	0			
Assumed Occupancy Rate	100%	100%	100%	100%	100%	100%
Size, SF	97500	97500	63750	64790	66055	66055
Total Construction Cost	09,763,459	$6,124,750	$5,650,875	$5,736,566	$5,039,395	$5,039,395
Starting Fiscal Year	1987	1987	1987	1987	1987	1987
Discount Rate	8.70%	8.70%	8.70%	8.70%	8.70%	8.70%

24-Jun

COST COMPARISON SUMMARY	MILCON	OPTION1 ON-BASE	OPTION2 ON-BASE	OPTION3 ON-BASE	OPTION4 ON-BASE	OPTION5 ON-BASE
TOTAL COST NPV	$24,799,569	$24,135,202	$19,850,681	$20,085,111	$20,366,427	$18,864,574
TOTAL REVENUE NPV (from other authorized users)	$0	$0	$0	$531,756	$1,169,863	$1,169,863
TOTAL ADJUSTED NPV	$24,799,569	$24,135,202	$19,850,681	$19,553,355	$19,196,565	$17,694,711
% of MILCON NPV		97%	80%	79%	77%	71%
ANNUAL RENT	$2,120,012	$2,063,218	$1,696,952	$1,716,992	$1,741,041	$1,612,654
LESS ANNUAL REVENUES (from other authorized users)	$0	$0	$0	$45,458	$100,007	$100,007
ANNUAL ADJUSTED RENT	$2,120,012	$2,063,218	$1,696,952	$1,671,535	$1,641,034	$1,512,647

ANNUAL
OPERATIONS
COSTS

24-Jun

	MILCON	OPTION1 ON-BASE	OPTION2 ON-BASE	OPTION3 ON-BASE	OPTION4 ON-BASE	OPTION5 ON-BASE
Percentage of Occupancy	100%	100%	100.0%	100.0%	100.0%	100.0%
Average Daily Room Rate	$30	$30	$30	$30	$30	$30
Revenues						
Rooms	$1,642,500	$1,642,500	$1,642,500	$1,678,500	$1,721,700	$1,721,700
Food	$0	$0	$0	$0	$0	$0
Beverage	$0	$0	$0	$0	$0	$0
Coin Laundry	$0	$13,688	$13,688	$13,913	$14,183	$14,183
Other Vending	$0	$8,760	$8,760	$8,904	$9,077	$9,077
Total	$1,642,500	$1,664,948	$1,664,948	$1,701,317	$1,744,959	$1,744,959
Departmental Expenses						
Rooms						
Total Payroll and Related Expenses	$0	$226,750	$226,750	$226,750	$226,750	$226,750
Transportation	$0	$0	$0	$0	$0	$0
Linen	$3,520	$3,520	$3,520	$3,521	$3,522	$3,522
Operating Supplies	$13,688	$7,118	$7,118	$7,235	$7,375	$7,375
Laundry and Dry Cleaning	$0	$9,253	$9,253	$9,405	$9,587	$9,587
Other	$198,743	$13,140	$13,140	$13,356	$13,615	$13,615
Food and Beverage	$0	$0	$0	$0	$0	$0
Total Departmental Expenses	$215,950	$259,780	$259,780	$260,266	$260,850	$260,850
Total Operated Departmental Income	$1,426,550	$1,405,168	$1,405,168	$1,441,050	$1,484,110	$1,484,110
Undistributed Operating Expenses						
Total Payroll and Related Expenses	$314,504	$132,625	$132,625	$132,625	$132,625	$132,625
Administrative and General	$0	$44,100	$44,100	$44,825	$45,695	$45,695
Basic Management Fee	$0	$0	$0	$0	$0	$52,349
Property Operation and Maintenance	$46,350	$46,350	$46,350	$47,112	$48,026	$48,026
Laundry Maintenance	$1,050	$1,050	$1,050	$1,067	$1,088	$1,088
Energy	$127,500	$127,500	$127,500	$129,596	$132,111	$132,111
Total	$489,404	$351,625	$351,625	$355,225	$359,545	$411,894

	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6
Income Before Fixed Charges	$937,146	$1,053,543	$1,053,543	$1,085,825	$1,124,565	$1,072,216
Fixed Charges						
Real Estate and Property Taxes	$162,929	$202,162	$137,099	$139,352	$142,057	$142,057
Building and Contents Insurance	$38,250	$38,250	$38,250	$38,879	$39,633	$39,633
Ground Rent	$0	$1,200	$1,200	$1,200	$1,200	$1,200
Total	$201,179	$241,612	$176,549	$179,431	$182,890	$182,890
Income Before Other Fixed Charges	$735,968	$811,931	$876,994	$906,394	$941,675	$889,326
Income Available for Debt Service	$735,968	$811,931	$876,994	$906,394	$941,675	$889,326
Model Outputs for Construction Costs						
Land Costs	$0	$0	$0	$0	$0	$0
Building Cost	$5,655,000	$7,146,750	$4,672,875	$4,749,689	$4,841,667	$4,841,667
Support and Site Cost	$2,200,000	$438,000	$438,000	$438,000	$438,000	$438,000
Design Cost	$522,083	$0	$0	$0	$0	$0
Contingency (5.0%)	$392,750	$0	$0	$0	$0	$0
SIOH (5.5%)	$453,626	$0	$0	$0	$0	$0
Tangible Personal Property	$540,000	$540,000	$540,000	$548,877	$559,529	$559,529
	$9,763,459	$8,124,750	$5,650,875	$5,736,566	$5,839,395	$5,839,395
Debt Principal	$0	$6,093,563	$4,238,156	$4,302,425	$4,379,547	$5,839,395
Annual Return on Investment	$0	$304,678	$211,908	$215,121	$218,977	$0
Annual Debt Service	$0	$694,930	$483,333	$490,663	$499,458	$510,660
Profit (Loss) Before Taxes	$735,968	$421,670	$605,569	$630,853	$661,194	$378,666

APPENDIX C

NAVFAC BACHELOR QUARTERS
ANALYSIS SYSTEM (BAS) MODEL
USER'S GUIDE

PREFACE

Appendix C was originally published separately as a temporary LMI report with a restricted distribution. We have reprinted it here with no changes. Thus, material in the original document or appended to it bears the same numbering and designation it did when previously published.

NAVFAC
Bachelor Quarters
Analysis System (BAS)
Model

Version 4.0

User's Guide

April 1990

LOGISTICS MANAGEMENT INSTITUTE
6400 Goldsboro Road
Bethesda, Maryland 20817-5886

CONTENTS

CONTENTS (Continued)

CHAPTER 1

THE MODEL

INTRODUCTION

The Bachelor Quarters Analysis System (BAS) Model is a management tool with which the Naval Facilities Engineering Command (NAVFAC) decision makers can perform comparative cost analyses of military construction (MILCON) versus private-sector options for bachelor quarters (BQ). The model is designed so that users can easily perform "what-if" analyses of several options and quickly compare the costs of each. The information in this guide, along with the BAS Model Decision Guide, is intended to facilitate decisions on whether a public/private venture (P/PV) for a specific Bachelor Officers Quarters (BOQ) or Bachelor Enlisted Quarters (BEQ) is feasible, and if it is, to identify project characteristics to ensure a successful project.

This user's guide is intended to be self-explanatory; however, if you have any questions concerning the operation of the model, call:

> Naval Facilities Engineering Command
> Facilities Development Division
> Commercial: (202) 325-7342
> Autovon: 221-7342

HARDWARE AND SOFTWARE REQUIREMENTS

The BAS Model requires a minimum configuration of hardware to execute properly. The target machine is an IBM PC, XT, AT, or compatible machine with a minimum of 512K of random access memory (RAM). The computer must have either a hard disk or two floppy disk drives; however, having a hard disk and one floppy drive is preferable. If you have 640K of RAM, there is a version of the BAS Model, with three private-sector options, that will allow more options to be viewed simultaneously. The user must have the Disk Operating System (DOS) software (Version 2.0 or later) and Lotus® 1-2-3® software (Release 2.01 or later) to run the

BAS Model. If unfamiliar with the basic concepts of Lotus 1-2-3, you should read the Lotus Reference Manual, in particular the first chapter, "Using 1-2-3."

If you do not have a printer, do not attempt to execute any of the print routines.

HARD DISK VERSUS FLOPPY SYSTEMS

On occasion in this guide, you will be given instructions for both hard disk and floppy systems. When this occurs, you will be given instructions as follows:

HARD DISK	Hard disk instructions
FLOPPY DISK	Floppy disk instructions

Follow the instructions that apply to your machine.

KEEPING FORMATTED DISKETTES

Since you may wish to compare several BQ options under different assumptions, you should consider keeping a separate "INPUTS Spreadsheet" file for each separate set of assumptions. The INPUTS Spreadsheet is large. You will not be able to store more than two INPUTS Spreadsheets per 360K floppy diskette. Therefore, you would be well advised to keep several formatted diskettes available if your primary means of storage is floppy diskette.

ON PATIENCE

On occasion, the spreadsheets will perform commands that may take a few minutes to execute. For instance, loading the spreadsheets or combining them may take several minutes. While these actions are occurring, it may appear that the model is sitting idle. However, the system is busy, and if you impatiently press keys thinking that the system has stopped, unexpected results may occur. The flashing "wait" in the upper right-hand corner of the screen indicates that the model is still executing a command. **Do not press any keys until prompted to do so.**

USER EXPERTISE

The BAS Model does not assume detailed knowledge of the use and construction of spreadsheets. In fact, most model commands are executed by selecting the appropriate menu option, or by answering questions as prompted by the computer.

You should, however, make yourself familiar with the reference guides that come with the Lotus 1-2-3 software (Release 2.01 or later).

INPUTS SPREADSHEET

To conform with the usual configuration of Federal PCs, the BAS Model is distributed on diskettes of 360K capacity. The diskette labeled "INPUTS Spreadsheet" holds the spreadsheet that allows you to enter the data values for your location. The INPUTS Spreadsheet includes variables pertaining to the name of the facility, the number of rooms, cost of capital, and military and private-sector salary information.

In addition, you will be able to execute the BQ Spreadsheet automatically and save your work, so that you can use the BQ Spreadsheet to do the analysis. It is strongly suggested that, when you save your work in the INPUTS Spreadsheet, you give the INPUTS Spreadsheet another DOS file name, so that you will be able to identify it later and avoid replacing the original INPUTS Spreadsheet.

BACHELOR QUARTERS SPREADSHEET

The second diskette, labeled "BQ Spreadsheet," holds the mathematical formulae that actually perform the calculations on the data values entered via the INPUTS Spreadsheet. This BQ Spreadsheet provides you functions to combine the data values you entered in the INPUTS Spreadsheet, view your work, and print information such as cost summary statements and pro forma statements.

CHAPTER 2

GETTING STARTED

Not all users will have the same hardware configuration. For example, some may have a hard disk, while others may have two disk drives. While implementing the instructions in this chapter, therefore, you should choose those computer commands that apply to your hardware configuration.

To avoid repeating the system definitions at each point, we will use the following conventions:

- A: refers to the main floppy drive.

- B: refers to the auxiliary floppy drive, either the second drive in a two-drive system or the single floppy drive in a hard-disk system.

- C: refers to the hard drive.

- Brackets are used to identify the legends on specific keys that the user will be required to press during the model run. Examples are: [ENTER]; [C], meaning "press ENTER"; press "C".

FORMATTING DISKETTES

In order to use a blank diskette to make copies, it must be formatted by DOS. Table 2-1 will be entered at the DOS prompt.

TABLE 2-1

FORMATTING DISKETTES

Command	Explanation/comment
A: [ENTER]	Estab..sh drive A as the default drive.
FORMAT B: [ENTER]	Be sure that your DOS diskette is in default drive A and that a new diskette is in drive B.
N [ENTER]	No, you do not wish to format another. If you did, then you would have pressed the letter "Y".

BACKING UP THE MODEL

Before using any software program, it is wise to make a back-up copy of the software. That way, if electronic or physical damage should occur to the diskettes, the user can recover. Use the back-up copies to do the analysis, and put the original INPUTS and BQ diskettes in a secure place.

Of course, you should make copies of your working spreadsheets on a regular basis. To do this, make drive A the default drive, place your working spreadsheets in drive A and the diskette that will hold the backup in drive B, and enter the data as shown in Table 2-2.

TABLE 2-2

BACKING UP DISKETTES

Command	Explanation/comment
COPY *.* B: [ENTER]	Copy the INPUTS diskette to drive B. Then, remove both diskettes and place the original BQ diskette in drive A and a new diskette in drive B.
COPY *.* B: [ENTER]	Copy the BQ diskette to drive B. Now, put the originals in a safe place.

You may choose to use the BAS Model on a computer with a hard disk and two floppy drives without copying the spreadsheets to the hard disk. In that case, follow the commands given above for a floppy system. On the other hand, you may wish to use the hard disk. To use a hard disk, you should first make a directory for the model on the hard disk and then copy the diskettes to that directory as shown in Table 2-3.

On occasion, you should back up your work on floppy diskettes and remove the files from the hard disk to save space since these files are rather large. To do this, make drive A the default drive, copy each file, and then delete it from the hard disk as shown in Table 2-4.

TABLE 2-3

COPYING FILES TO HARD DISK

Command	Explanation/comment
C: CD\[ENTER]	*Be sure that drive C is the default drive and that the root node is the current path.*
MD\BQ[ENTER]	*Make a directory for the diskettes.*
CD\BQ[ENTER]	*Make the BQ directory the default.*
VERIFY ON [ENTER]	*Turn verification on to ensure exact copies and place the INPUTS diskette in drive A.*
COPY A:*.* [ENTER]	*Copy INPUTS to the current directory. When the copying process is finished, place the BQ diskette into drive A and copy it.*

TABLE 2-4

DISK/FILES MANAGEMENT

Command	Explanation/comment
A: [ENTER] COPY C:\BQ\ file name A: [ENTER]	*Make drive A the default drive. Copy the file from the hard disk to drive A. Substitute "file name" with the full file name that you wish to copy.*
ERASE C:\BQ\ file name [ENTER]	*Erase the file just copied.*

CONTROLLING THE CELL POINTER

In all but one case when you are entering values into the INPUTS Spreadsheet, the movement of the cell pointer through the worksheet will be controlled for you. The one exception occurs when you select an item to change (see Appendix A). It is very important that you **do not attempt to use the arrow keys** while the movement of the cell pointer is being controlled for you because you may throw the system out of sync. In fact, during these operations, you may activate the numeric keypad by pressing the NUM LOCK key, allowing you to enter numeric values faster.

EXECUTING THE INPUTS SPREADSHEET

Once Lotus 1-2-3 is loaded, you will be ready to execute the INPUTS Spreadsheet. To do so, you will access the Lotus Command Menu and select the File Directory and File Retrieve functions. When INPUTS executes, you will be at the Inputs Main Menu (see Appendix B). Perform the instructions in Table 2-5 in order to execute INPUTS.

TABLE 2-5

EXECUTING INPUTS

Command	Explanation/comment
/FD Directory [ENTER]	Press the slash, the letter "F", the letter "D", and select a directory name. For instance, users with two floppy drives might choose "B:" as the directory, whereas users with hard disks might choose "C:\BQ" as the directory. Then, press ENTER.
/FR	Press the slash, the letter "F", and the letter "R". Do not press ENTER at this time.
INPUTS [ENTER]	Type "INPUTS" and press ENTER. However, if INPUTS is highlighted on the third row of the control panel, simply press ENTER.

Upon successfully completing these steps, you will be ready to use the BAS Model.

THE COMMAND STRUCTURE

For your convenience, a quick reference guide to the functions available in the INPUTS and BQ Spreadsheets is provided in Appendix A. That guide, referred to as the Command Structure, will tell you what sequence of menu options you need to execute in order to select a specific function. You may select a specific command by using the left/right arrow keys and pressing return, by using the space bar and pressing return, or by selecting a function that begins with a letter of the alphabet by pressing that letter.

For example, suppose you wished to view the MILCON option. You would begin at the INPUTS Spreadsheet Main Menu. You will notice that the INPUTS Spreadsheet Main Menu Command Structure has six options: Inputs, Autoexecute, Salaries, File, Erase, and Quit. Since you wish to access the functions that operate on

the MILCON Inputs data, you would highlight "Inputs" by using the left or right arrow keys on the numeric keypad of the keyboard, or the space bar, and pressing the return or enter key. Alternatively, you could simply press the letter "I". This will take you to the next level of the Inputs Command Structure, called the Inputs Menu, where you have the option to Browse, Change, Print Inputs, or Quit. Select "Browse" by pressing return or pressing the letter "B". This takes you to the Browse Menu.

Since you wish to view the MILCON Option in this example, either press return (since MILCON will be highlighted) or press the letter "M". At this point, the view of the spreadsheet will be changed from the menu system to the MILCON Inputs area. You will be given the option of continuing to view MILCON Inputs or quitting.

When you do quit (by highlighting "Quit" and pressing return) or get to the end of the MILCON Inputs data, you will return to the Browse Menu. If you wish to quit the Browse Menu and return to the Main Menu, then select "Quit". This takes you to the Inputs Menu, where you will select "Quit" again. Now you should be at the Main Menu.

To return to each successive higher level of the Command Structure from any menu, you select "Quit" by highlighting "Quit" and pressing return. Or, you may press the "Q" or the "Esc" key (escape key). Be careful, though: if you select "Quit" at the Main Menu, you will be returned to DOS, which may or may not be what you desire.

Notice the Command Structure in Appendix A. For instance, the BQ Main Menu has five options as follows: Combine, Browse, Print, Erase, and Quit. One of the philosophies used in constructing the BQ Spreadsheet is to allow you to browse a part of it and then print that part, just as it appeared while you were browsing. Thus, the command option for Browse Summary is the same as that for Print Summary.

ANSWERING PROMPTS (Y/N)

In several situations, you will be required to answer prompts to ensure that you wish to execute a specific command. For instance, when you request to erase a spreadsheet, you will be asked. "Are you sure (Y/N)?" This feature is a fail-safe mechanism to guarantee that you execute only those commands you wish to execute. If you did not wish to erase the spreadsheet in the example above, you would have pressed the letter "N" (upper case or lower case) and then pressed the ENTER key.

On the other hand, if you did wish to erase the spreadsheet, you would press "Y" and the ENTER key.

> Are you sure (Y/N)?
> Y [ENTER]
> *Press the letter "Y" and press the ENTER key to indicate that yes, you wish to erase the spreadsheet.*
> N [ENTER]
> *Press the letter "N" and press the ENTER key to indicate that you do not wish to erase the spreadsheet.*

ERROR CONDITIONS ALT + M

Should you make an error from which the system cannot recover, Lotus 1-2-3 will beep and the message "Error" will blink in the mode indicator (see "1-2-3 Indicators" of the Lotus Reference Manual for a description of the mode indicator). If this occurs, you may begin again from the Main Menu by first pressing the escape key and then holding down the alternate key and lightly tapping the letter "M".

> Esc   *Press the escape key.*
> ALT + M   *Press alternate key and lightly tap the letter "M".*

MENUS AND PROMPTS

Both the INPUTS and BQ Spreadsheets have an extensive set of menus to guide you through the systems. See Appendix B for the INPUTS Menus and Appendix C for the BQ Menus.

By using the Command Structure (Appendix A) and the menu appendices, you should have no problem finding the command necessary to perform a certain function. For instance, suppose you wish to print the INPUTS Spreadsheet. Referring to the Command Structure, you will notice that, to print, you would begin at the INPUTS Main Menu and select Inputs. All functions associated with the INPUTS Spreadsheet functions are located at this option.

At the Inputs Menu, you have the option to Browse, Change, Print Inputs, or Quit the Inputs Menu. Of course, at this point you would select the Print Inputs option. Notice that each menu provides a list of options in addition to a brief description of each option.

In addition, you will be prompted to ensure that you do not make an irrecoverable error. For instance, when you select File from the INPUTS Main Menu, you will be asked if the appropriate INPUTS Spreadsheet disk is in the default drive (see Appendix B). This question is designed so that users maintaining copies on floppy drives are given the opportunity to ensure that there is a diskette in the default drive.

DATA ENTRY FORM

To assist you in planning and in entering data into the INPUTS Spreadsheet, a Data Entry Form is provided at Appendix D. You are encouraged to photocopy this form and fill it in before actually entering values into INPUTS. Also, you may want to print a copy of the Data Entry Form found in Print Inputs of the Main Menu. You are cautioned that the INPUTS Spreadsheet will not appear exactly like the Data Entry Form. In addition, some fields are blanked out on the form, because they are calculated by the INPUTS Spreadsheet rather than entered by you.

CHAPTER 3

TUTORIAL

This chapter of the user's guide provides a tutorial that will lead you through a typical series of steps you might execute in order to use the BAS Model. The example used for the tutorial is a transient BOQ at the mythical "Maryland" naval base. A MILCON option is compared with one private-sector option. Appendix E shows the data that base personnel have gathered and the guaranteed occupancy and loan factors they want to assess in this particular comparison.

ENTERING AND SAVING INPUTS

In this part of the tutorial, you will build the INPUTS Spreadsheet. Since the INPUTS Spreadsheet drives the whole model, building it must be your first activity.

Since you will enter two analysis options — MILCON and one private-sector option — you will use the options for selecting the function to make a global change of factors and you will select columns to change. After you have loaded the INPUTS Spreadsheet (see the section, "Executing the INPUTS Spreadsheet," in Chapter 2), you will be at the INPUTS Main Menu. Reviewing the Command Structure (Appendix A), you will see the path you must travel in order to do this exercise.

The following discussion will guide you as you enter the data appearing in Appendix E. After each data input is made, the cell pointer will jump to the next cell requiring input. In doing so, it often skips over many cells that do not need user input. The user need not be concerned since the model will take care of these other cells automatically.

The following are the steps to take:

- *Step 1:* Begin the process by pressing "I" for Inputs, "C" for Change, and "F" for Factors.

- *Step 2:* Is this an Officer or Enlisted project (O/E/Q)? Press the letter "O" and press ENTER. This indicates that this is a project for a BOQ.

- *Step 3:* Enter TDY Officers' Per Diem. Enter 75 — this is $75 per day per person.

- *Step 4:* Permanent Party Officers' BAQ & VHA. Enter 22 — this is $22 per day per person. (A zero could be input here, since the tutorial example is for a transient BOQ, and this input will not be used.)

- *Step 5:* Private Option Guarantee and Interest Rate. Press ENTER while the cell pointer highlights the "Private Option 1".

- *Step 6:* Is the occupancy rate guaranteed? Press "Y" and press ENTER.

- *Step 7:* Guaranteed Occupancy Rate. Enter 0.9 which will display as 90%. The cursor will then skip to Interest Rate.

- *Step 8:* Mortgage/Bond Rate. Enter the bond rate as 0.08. The model enters a profit rate on equity before taxes, and the cell pointer jumps back to the Lotus option line at the top of the screen.

- *Step 9:* Once these actions are completed, press "Q" to quit this step.

Steps 10 through 14 input the Private-Sector Costs per Square Foot (zeros could be entered in steps 11 through 13 since the tutorial example is for a transient BOQ).

- *Step 10:* TDY — Transient Officer. Enter 76.67.

- *Step 11:* Permanent Party Officer. Enter 81.50.

- *Step 12:* Enlisted 1 (E1 — E4). Enter 78.33.

- *Step 13:* Enlisted 2 (E5 & above). Enter 78.33.

- *Step 14:* Other Authorized Users. Enter 76.67.

Construction Factors

- *Step 15:* Does the Davis-Bacon Act apply (Y/N)? Enter "N" — the Davis-Bacon Act does not apply to this project.

- *Step 16:* Support & Site. Enter 1462000. This is $1,462,000.

- *Step 17:* Special. Enter 1991000 for special construction features. This is $1,991,000.

- *Step 18:* Annual Contract Management Cost. Enter 30000 which will display as $30,000.

- *Step 19:* Do other vending revenues apply (Y/N/Q)? Press "Y" to indicate that vending machine revenues will be included in the P/PV contract agreement.

- *Step 20:* Variable Housing Allowance (VHA). Enter the following VHA rates:

Rank	VHA
O-10	487.70
O-9	487.70
O-8	487.70
O-7	487.70
O-6	513.48
O-5	519.06
O-4	524.07
O-3	494.67
O-2	439.62
O-1	441.96
O-3E	476.23
O-2E	465.93
O-1E	449.94
W-4	503.06
W-3	508.42
W-2	489.84
W-1	464.19
E-9	405.58
E-8	443.98
E-7	373.05
E-6	367.33
E-5	349.38
E-4	296.04
E-3	292.15
E-2	295.07
E-1	285.22

- *Step 21:* Location. Is option on (B)ase, o(F)f base, or (N)one (B/F/N)? Enter "B" for "on base." This indicates that Private Option 1 is on base. The cursor will now return to the Change Inputs Menu. The next step will be to select the option to change a column.

- *Step 22:* Press the letter "C". Since MILCON is highlighted, you need only press ENTER to input data into the MILCON Column. Once ENTER is pressed, the model takes a moment to perform some internal operations.

- *Step 23:* Location. Input MARYLAND.

- *Step 24:* Transient Officers' Rooms. Input 150.

- *Step 25:* Permanent Party Officers' Rooms. Input 0, or simply press ENTER.

- *Step 26:* Enlisted 1 (E1 – E4) Modules. Input 0, or press ENTER.

- *Step 27:* Enlisted 2 (E5 & above) Modules. Input 0, or press ENTER.

- *Step 28:* Expected Occupancy Rate. Input 0.95 – this is 95 percent.

- *Step 29:* Number of Nonavailabilities (Annual). Input 482820.

- *Step 30:* Building Cost. Input 6005000. This is $6,005,000.

- *Step 31:* Land Cost. Input 0, or press ENTER.

- *Step 32:* Real Estate and Property Tax Rate. Input 0.0263 – this is 2.63 percent.

- *Step 33:* Annual Transportation Cost. Input 0, or press ENTER.

- *Step 34:* Tangible Personal Property (Restaurant). Input 0, or press ENTER.

- *Step 35:* Base Year for Project Start. Input 1991.

- *Step 36:* Rooms Expense: Linen. The base does not want to change the default value displayed, so press ENTER. The base could have changed this value if desired.

- *Step 37:* Rooms Expense: Operating Supplies. Use the default value, and press ENTER.

- *Step 38:* Rooms Expense: Laundry and Dry Cleaning. Input 0, or press ENTER.

- *Step 39:* Rooms Expense: Other. Use the default value, and press ENTER.

- *Step 40:* F&B Expense Ratio, Non-Payroll. Input 0, or press ENTER.

- *Step 41:* Fixed F&B Expense at Any Occupancy. Input 0, or press ENTER.

- *Step 42:* Property Operations and Maintenance. Use the default value, and press ENTER.

- *Step 43:* Percentage Number of Washers and Dryers. Use the default value, and press ENTER.

- *Step 44:* Laundry Maintenance. Input 7.57.

- *Step 45:* Energy Expense. Input 919.

- *Step 46:* Post Contract Award Support. Input 0.04.

- *Step 47:* Tangible Personal Property Transient Officers. Use the default value, and press ENTER.

- *Step 48:* Tangible Personal Property Permanent Party Officers. Use the default value, and press ENTER.

- *Step 49:* Tangible Personal Property Enlisted 1. Use the default value, and press ENTER.

- *Step 50:* Tangible Personal Property Enlisted 2. Use the default value, and press ENTER.

- *Step 51:* Transient Officers – Gross SF/Room. Use the default value, and press ENTER.

- *Step 52:* Permanent Party Officers – Gross SF/Room. Use the default value, and press ENTER.

- *Step 53:* Enlisted (E1 – E4) – Gross SF/Module. Use the default value, and press ENTER.

- *Step 54:* Enlisted (E5 & above) – Gross SF/Module. Use the default value, and press ENTER.

The model will next take a moment for some internal operations and then return the user to the Column Change Inputs Menu. The last section will require selecting the function to change Private Option 1. Press the right arrow key once and press ENTER to make that choice. Fewer entries will be needed for the private-sector option.

- *Step 55:* Expected Occupancy Rate. Input 0.95 – this is 95 percent.

- *Step 56:* Land Cost. Input 0, or press ENTER.

- *Step 57:* Annual Transportation Cost. Input 0, or press ENTER.

- *Step 58:* Tangible Personal Property (Restaurant). Input 0, or press ENTER.

- *Step 59:* Contract Term. Input 32 – this is 32 years.

- *Step 60:* Loan Amortization Period. Input 32 — this is also 32 years.

- *Step 61:* Estimate — Other Authorized Users, Annual Nights. Input 73000.

- *Step 62:* Percentage of Potential Guests, Per Day. Use the default value, and press ENTER.

- *Step 63:* Other Authorized Users' Transient Personal Property. Input 3894 — this is $3,894.

The model will then return the user to the Column Change Inputs Menu.

- *Step 64:* Press "Q" three times to quit the submenus and return to the Main Menu. You have now completed your data inputs.

You should be at the INPUTS Main Menu. Follow the steps in Table 3-1 to save INPUTS under the DOS file name TUTOR. You are ready to proceed to the next part of the tutorial.

TABLE 3-1

SAVING THE TUTOR FILE

Command	Explanation/comment
F	*Press the letter "F" to file your work.*
Y	*This prompt gives you the opportunity to ensure that the disk on which you wish to save INPUTS is in the default drive (if you wish to use diskettes). When ready, press "Y" and press ENTER.*
TUTOR [ENTER]	*Give the disk file a name other than the name INPUTS, and do not use a file name extension (e.g., CAL2).*

BROWSING AND PRINTING INPUTS

This part of the tutorial assumes that you are at the INPUTS Main Menu. During this part of the tutorial, you will review the data you just entered and print the INPUTS Spreadsheet. The data you entered should look like the printout in Appendix F. Table 3-2 will guide you as you do the exercises.

If you discover an error while comparing your entries with Appendix F, then you will go to the Selective Change Inputs Menu (Appendix B, Figure B-5) and choose the Item option. This option will allow you to change a specific cell by positioning the cell pointer to that cell and entering a new value. Be careful to position only to a

TABLE 3-2

BROWSING THE INPUTS

Command	Explanation/comment
I, B, M	*Choose Inputs, Browse, and MILCON. See Appendix B, Figure B-3, for the Browse Inputs Menu.*
[ENTER]	*Press ENTER to continue browsing, or you could quit by pressing "Q". To view the entire MILCON column, you will press ENTER a total of seven times.*
[RIGHT], [ENTER]	*Choose Private Option 1 and press ENTER. See Appendix B, Figure B-3.*
[ENTER]	*Once again, you will press ENTER seven times to view all the data values in Private Option 1. To quit, press "Q".*

visible cell, because trying to change a nonvisible cell or a protected cell will cause an irrecoverable error. If this occurs, press the Esc key and then the ALT + M keys to go back to the INPUTS Main Menu and start over.

You will want to make a hard copy of the INPUTS Spreadsheet. Assuming you are still at the Browse Inputs Menu, you will press Esc to go to the Inputs Menu (Appendix B, Figure B-2). At this point, you would select the option to Print Inputs, which takes you to the Print Inputs Menus (Appendix B, Figure B-9), then choose INPUTS. Your output should look like Appendix F. Once the printer is finished, go to the INPUTS Main Menu by pressing the "Q" key twice to complete the remainder of the tutorial.

AUTOEXECUTE BQ AND COMBINE INPUTS

When the INPUTS Spreadsheet is built, you will automatically execute the BQ Spreadsheet from the INPUTS Main Menu. Then, you will link or combine the INPUTS Spreadsheet witn the BQ Spreadsheet (see Table 3-3). Some of the procedures will take a few minutes, so be patient and do not unnecessarily press keys.

After completion of the commands described thus far ι this section, you should have the BQ Main Menu on your screen. You are now ready to view and print the results of the analysis.

TABLE 3-3

AUTOEXECUTE

Command	Explanation/comment
A	*Select the Autoexecute option from the INPUTS Main Menu. See Appendix B.*
Y [ENTER]	*Press the letter "Y" when the appropriate INPUTS Spreadsheet disk is in the default drive.*
TUTOR [ENTER]	*The INPUTS Spreadsheet will be saved using the file name "TUTOR". Since you have already saved TUTOR, you could have used the arrow keys to highlight TUTOR as the file name to save and then you could have pressed ENTER. Be patient; this will take a few minutes.*
Y [ENTER]	*Press "Y" and ENTER when the disk holding the BQ Spreadsheet is in the default drive. This procedure will take from 3 to 7 minutes, depending upon the configuration of your system. Once again, be patient. When the BQ Spreadsheet is fully loaded, you will see the BQ Main Menu, which is provided for you in Appendix C, Figure C-1.*
C	*In order to use the BQ Spreadsheet, you must bring in or combine the INPUTS Spreadsheet with the BQ Spreadsheet.*
Y [ENTER]	*Press "Y" and ENTER when the disk containing the INPUTS Spreadsheet is in the default drive.*
TUTOR [ENTER]	*Type in the file name of INPUTS (e.g., CAL2 or whatever name you assigned) and press ENTER (or use the arrow keys to highlight your choice and press ENTER). This procedure will also take a few minutes, so be patient.*

BROWSE AND PRINT MODEL SUMMARIES

Now we will review the BQ Spreadsheet Cost Summary Report on the screen and print a copy of the summaries for the MILCON option and the private-sector option. To do this exercise, you should begin from the BQ Main Menu, as depicted in Appendix C.

Complete the steps in Table 3-4, and your printed reports should look like the sample reports given in Appendix G.

TABLE 3-4

BROWSING AND PRINTING THE RESULTS

Command	Explanation/comment
B	*Select the Browse option from the BQ Main Menu.*
S	*Select the Summary option, which will be the first option on the Browse Menu. See Appendix C, Figure C-2.*
M	*Select the MILCON option from the Browse Cost Summary Menu. Refer to Appendix C, Figure C-3.*
[ENTER]	*Press ENTER when you have completed reviewing the MILCON option. Pressing ENTER will return you to the Browse Cost Summary Menu.*
[RIGHT], [ENTER]	*Choose Private Option 1 to view from the Browse Cost Summary Menu.*
[ENTER]	*Press ENTER when you have completely reviewed Private Option 1.*
[ESC], [ESC]	*Press the escape key twice to move back to the BQ Main Menu.*
[RIGHT], [RIGHT], [ENTER]	*Move the menu cursor on the second row of the control panel to the Print option and press ENTER. This will move you to the BQ Print Menu, which appears in Appendix C, Figure C-7.*
[ENTER]	*Press ENTER to select the first option on the Print Menu, which is to print the Summary report.*
M	*Choose the MILCON option from the Print Cost Summary Menu. See Appendix C, Figure C-8, for the appearance of this menu. <u>Be careful that your printer is on line</u> before you press ENTER, or you will cause an irrecoverable error (see the section on "Error Conditions ALT + M" in Chapter 2 if you cause an error). When the printer is finished, you will return to the Print Cost Summary Menu.*
[RIGHT], [ENTER]	*Choose Private Option 1 to print from the Print Cost Summary Menu. Make sure the printer is on line.*
[ESC], [ESC]	*Press the escape key twice to move back to the BQ Main Menu.*
Q	*Press the left arrow key to highlight the Quit option and press ENTER.*
Y [ENTER]	*Press the letter "Y" and return in order to exit back to DOS.*

This tutorial has guided you through some of the BAS Model's more basic functions. You are encouraged to try some of the other functions. For instance, the function to change a single cell in the INPUTS Spreadsheet (see Appendix B, Figure B-5) will allow you to do "what if" analysis with the system. It is expected that this feature will be extremely useful after the initial INPUTS model is built.

APPENDIX A

NAVAL FACILITIES ENGINEERING COMMAND
BACHELOR QUARTERS ANALYSIS SYSTEM:
COMMAND STRUCTURE

NAVAL FACILITIES ENGINEERING COMMAND
BACHELOR QUARTERS ANALYSIS SYSTEM:
COMMAND STRUCTURE

```
                              ┌─ MILCON
                              ├─ Private Option 1
                  ┌─ Browse ──┤
                  │           ├─ Row          ┌─ Per Diem          ┌─ Private Option 1
   ┌─ Inputs ─────┤           └─ Quit         ├─ Guarantee ────────┤
   │              │                           │                    └─ Quit
   │              │                           ├─ Special Factors ──┬─ Resident
   │              │                           ├─ Option Headings   ├─ Davis-Bacon
   │              │                           ├─ Item              ├─ Construction
   │              │           ┌─ Select ──────┤  Quit              ├─ Annual Contract
   │              ├─ Change ──┤  Column ──────┤  MILCON            ├─ Other Vending
   │              │           ├─ All          ├─ Private Option 1  └─ Quit
   │              │           ├─ Factors      └─ Quit
   │              │           ├─ VHA
   │              │           └─ Quit
   │              │
   │              ├─ Print INPUTS ─────┬─ Inputs
   │              │                    ├─ Data Entry
   │              └─ Quit              ├─ Eject
   │                                   └─ Quit
   │
   ├─ Autoexecute
   │
INPUTS                       ┌─ VHA
Main Menu                    ├─ Room
   │                         ├─ Undistributed
   ├─ Salaries ──────────────┤
   │                         ├─ Food
   ├─ Current Inflation      ├─ Military
   ├─ File                   └─ Quit
   ├─ Erase
   └─ Quit
```
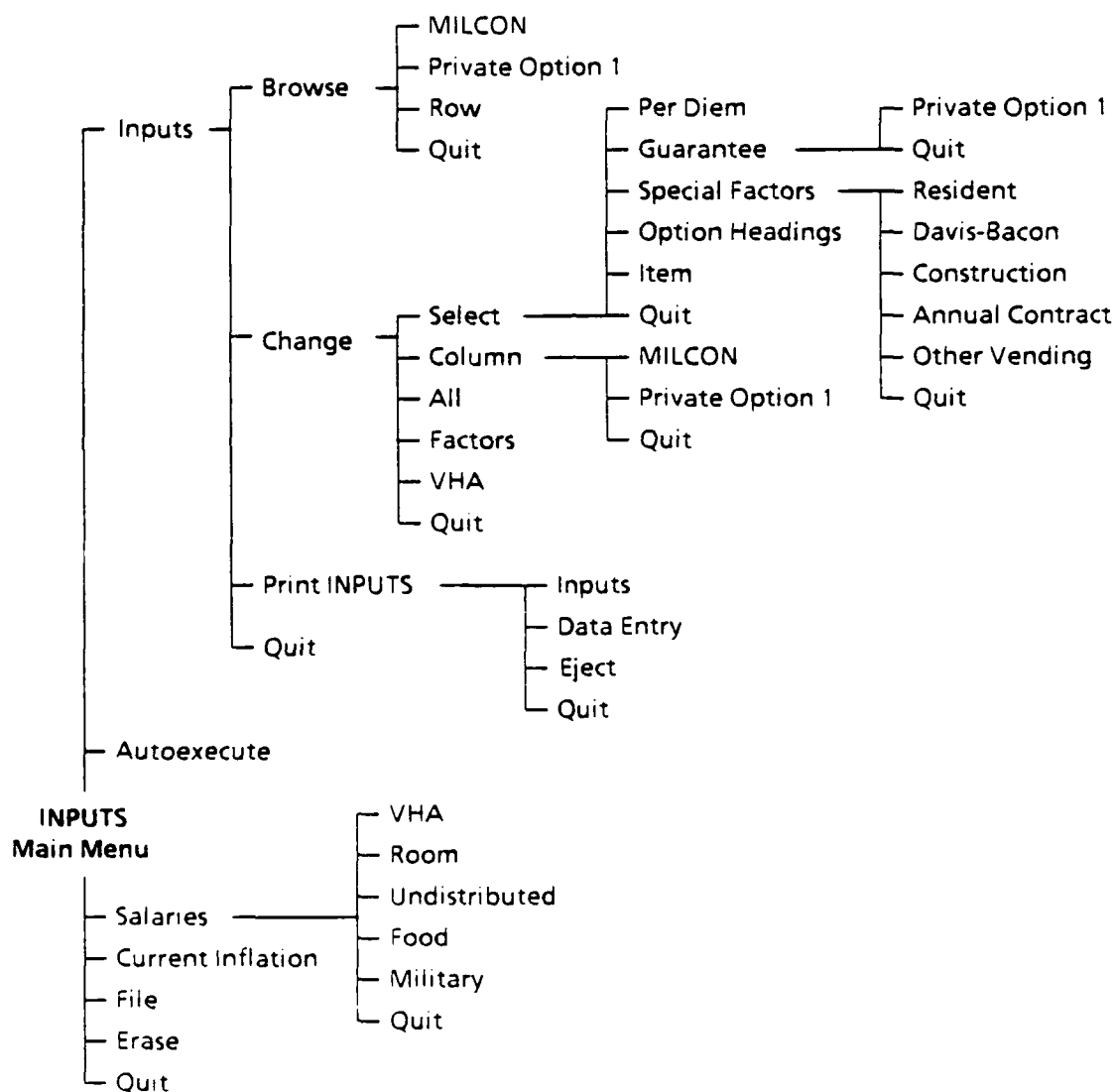
Note: MILCON – military construction and VHA – variable housing allowance

FIG. A-1. INPUTS SPREADSHEET
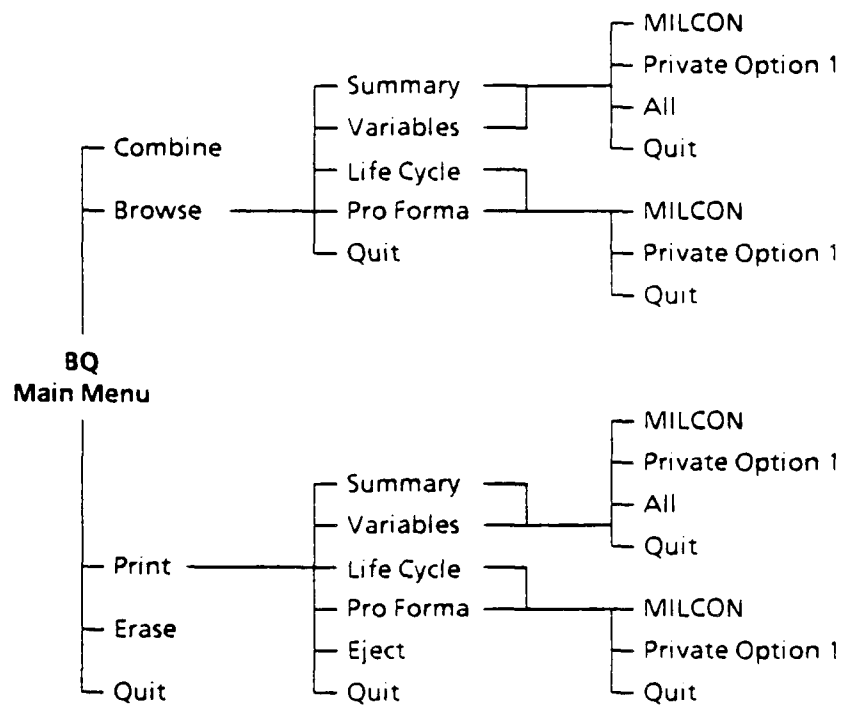
FIG. A-2. BACHELOR QUARTERS (BQ) SPREADSHEET

APPENDIX B

INPUTS SPREADSHEET MENUS

INPUTS SPREADSHEET MENUS

```
DC909:  [W18]  + $LMI – LOGO                                    MENU

Inputs  Autoexecute  Salaries  Current Inflation  File  Erase  Quit

Functions Which Access the INPUTS Spreadsheet
              DC          DD        DE        DF        DG        DH        DI

909   LMI BQ-Analysis System                22-Feb                    Version:
910   INPUTS89.WK1                      MAIN MENU                         4.0
911
912
913                        Instructions for the Main Menu
914
915        Use the right or left arrow keys and highlight the selection you wish
916        to execute.  Then press [ENTER].
917
918   MAIN MENU
919   COMMAND                              EXPLANATION
920  -----------------------------------------------------------------------
921   INPUTS            The INPUTS Spreadsheet functions are found here.
922   AUTOEXECUTE       Save INPUTS and execute the BQ Spreadsheet.
923   SALARIES          The SALARIES Spreadsheet functions are found here.
924   CURRENT INFL      View the Current Inflation Factor.
925   FILE              File the entire spreadsheet on disk after changing.
926   ERASE             Erase the spreadsheet and remain in 123.
927   QUIT              Quit 123 and return to DOS (the operating system).
928

22-Feb-90    08:04 AM                      CMD
```

FIG. B-1. MAIN MENU

```
DC929:  [W18] + $LMI – LOGO                                          MENU

Browse     Change    Print INPUTS    Quit

Browse INPUTS Spreadsheet Options

              DC        DD        DE         DF        DG        DH        DI

929   LMI BQ-Analysis System                22-Feb                    Version:
930   INPUTS89.WK1                        INPUTS MENU                      4.0
931
932
933                      Instructions for the Inputs Menu
934
935        Use the right or left arrow keys and highlight the selection you wish
936        to execute.  Then press [ENTER].
937
938   INPUT MENU
939    COMMAND                              EXPLANATION
940  -----------------------------------------------------------------------------
941   BROWSE            Functions that view the INPUTS Spreadsheet.
942   CHANGE            Functions that change the INPUTS Spreadsheet.
943   PRINT INPUTS      Functions that print the INPUTS Spreadsheet.
944   QUIT              Quit INPUTS Spreadsheet and return to MAIN MENU.
945
946
947
948

22-Feb-90    08:22 AM                        CMD
```

FIG. B-2. INPUTS MENU

```
DJ949:  [W15]  + $LMI – LOGO                                          MENU

MILCON          Private Option 1        Row          Quit

Browse the MILCON Column

              DJ          DK         DL         DM         DN         DO         DP

949   LMI BQ-Analysis System                    22-Feb                    Version:
950   INPUTS89.WK1                    BROWSE INPUTS MENU                       4.0
951
952
953                  Instructions for the Browse Inputs Functions
954
955        Use the right or left arrow keys and highlight the selection you wish
956        to execute.  Then press [ENTER].
957
958    BROWSE INPUTS
959      COMMAND                                    EXPLANATION
960   ------------------------------------------------------------------------
961       MILCON          View the MILCON column in INPUTS without making changes.
962       OPTION 1        View Private Option 1 in INPUTS without changing.
963       ROW             View INPUTS spreadsheet by row without making changes.
964       QUIT            Quit BROWSE INPUTS MENU and return to INPUTS MENU.
965
966
967
968

22-Feb-90    08:24 AM                          CMD
```

FIG. B-3. BROWSE INPUTS MENU

```
DJ969:  [W15] + $LMI – LOGO                                          MENU

Select    Column    All    Factors    VHA    Quit

Select Option or Item to Change in the INPUTS Spreadsheet

              DJ        DK        DL        DM        DN        DO        DP

969   LMI BQ-Analysis System              22-Feb                    Version:
970   INPUTS89.WK1               CHANGE INPUTS MENU                      4.0
971
972
973                   Instructions for the Change Inputs Functions
974
975        Use the right or left arrow keys and highlight the selection you wish
976        to execute.  Then press [ENTER].
977
978   CHANGE INPUTS
979      COMMAND                                    EXPLANATION
980   -----------------------------------------------------------------------
981      SELECT              Change special factors or a single cell.
982      COLUMN              Change the MILCON or Private Option column.
983       ALL                Change all data in the INPUTS Spreadsheet.
984      FACTORS             Global change of special factors.
985      VHA                 Change Variable Housing Allowance (VHA).
986      QUIT                Quit change functions and return to INPUTS MENU.
987
988

22-Feb-90    08:26 AM                        CMD
```

FIG. B-4. CHANGE INPUTS MENU

```
DJ829:  [W15]  + $LMI – LOGO                                          MENU

Diem     Guarantee    Special Factors    Option Headings    Item    Quit

Enter Type Project and BAQ/VHA Per Diem Information

              DJ          DK          DL          DM          DN          DO          DP

829   LMI BQ-Analysis System                      22-Feb                         Version:
830   INPUTS89.WK1              SELECTIVE CHANGE INPUTS MENU                         4.0
831
832
833                    Instructions for the Selective Change Inputs Functions
834
835        Use the right or left arrow keys and highlight the selection you wish
836        to execute.  Then press [ENTER].
837
838    CHANGE INPUTS
839       COMMAND                                      EXPLANATION
840   -----------------------------------------------------------------------------
841        DIEM                 Enter type of project (Officer/Enlisted) and per diem.
842      GUARANTEE              Change the guaranteed occupancy rate/loan information.
843    SPECIAL FACTORS          Construction factors, Davis-Bacon, and Vending Revenues.
844    OPTION HEADINGS          Change option headings to ON or OFF base.
845        ITEM                 Change a single cell in INPUTS Spreadsheet.
846        QUIT                 Quit this menu and return to CHANGE INPUTS MENU.
847
848

22-Feb-90    08:27 AM                          CMD
```

FIG. B-5. SELECTIVE CHANGE INPUTS MENU

```
DJ869:  [W15] + $LMI – LOGO                                        MENU

Private Option 1      Quit

Change Private 1 Guarantee and Interest Rate

            DJ        DK        DL        DM        DN        DO        DP

869    LMI BQ-Analysis System                 22-Feb                    Version:
870    INPUTS89.WK1      GUARANTEED OCCUPANCY AND LOAN FACTORS          4.0
871
872
873
874    ========= OCCUPANCY/LOAN FACTORS    =========           AMOUNT
875              GUARANTEED OCCUPANCY RATE                            0%
876              LOAN AMOUNT (100% GUARANTEED, 75% IF NOT)            0%
877              MORTGAGE/BOND RATE*                                  0%
878              PROFIT RATE ON EQUITY, BEFORE TAXES               18.0%
879
880
881
882
883              *  IF GUARANTEED OCCUPANCY RATE < = 75%
884                    ENTER MORTGAGE RATE (11 – 18%)
885                 ELSE
886                    ENTER BOND RATE (7 – 11%)
887
888

22-Feb-90     08:33 AM                        CMD
```

FIG. B-6. GUARANTEED OCCUPANCY AND LOAN FACTORS

```
DJ909: [W15] + $LMI – LOGO                                    MENU

Resident   Davis-Bacon   Construction   Annual Contract   Other Vending   Quit
Change Costs by Resident Type

              DJ         DK         DL         DM         DN         DO         DP

909   LMI BQ-Analysis System              22-Feb                    Version:
910   INPUTS89.WK1          SPECIAL FACTORS ENTRY FORM                 4.0
911   -------- PRIVATE-SECTOR ----
912        COST PER SQUARE FOOT    |    BASIC ALLOWANCE FOR SUBSISTENCE
913           BY RESIDENT TYPE     |        OFFICERS        $119.61  /MO
914   --------------------------------        ENLISTED         $5.70  /DA
915   RESIDENT        COST PER      |
916   TYPE            SQ. FOOT      |    MILCON BUILDING CONSTRUCTION COSTS
917   ============================= :    =======================================
918   TDY – TRANSIENT    $0.00           SUPPORT & SITE          $0
919   PP – PERM. PARTY   $0.00           SPECIAL                 $0
920   ENLISTED 1         $0.00                                 ---------
921   ENLISTED 2         $0.00           TOTAL                   $0
922   OTHR AUTH USERS    $0.00
923                                       =======================================
924                                       ANNUAL CONTRACT MGMT COST    $30,000
925   DAVIS-BACON ACT ADJUSTMENT          =======================================
926   ===========================         |----- OTHER VENDING REVENUES ------|
927     DOES THE DAVIS-BACON ACT          REVENUES SWITCH (Y/N)?
928     APPLY (Y/N)? y                    Y

22-Feb-90    08:35 AM                      CMD
```

FIG. B-7. SPECIAL FACTORS ENTRY FORM MENU

```
DJ989: [W15] + $LMI - LOGO                                        MENU

 MILCON         Private Option 1        Quit

Change all cells in MILCON column of INPUTS

           DJ        DK        DL        DM        DN ·      DO        DP

989    LMI BQ-Analysis System                  22-Feb                 Version:
990    INPUTS89.WK1             COLUMN CHANGE INPUTS MENU                4.0
991
992
993                 Instructions for the Selective Change INPUTS Functions
994
995          Use the right or left arrow keys and highlight the selection you wish
996          to execute.  Then press [ENTER].
997
998    COLUMN CHANGE
999       COMMAND                                   EXPLANATION
1000   ---------------------------------------------------------------------------
1001      MILCON               Change the MILCON column in INPUTS Spreadsheet.
1002      OPTION 1             Change the Private Option 1 column in INPUTS Spreadsheet.
1003      QUIT                 Quit this menu and return to CHANGE INPUTS MENU.
1004
1005
1006
1007
1008

 22-Feb-90   08:29 AM                        CMD
```

FIG. B-8. COLUMN CHANGE INPUTS MENU

```
DC949:  [W18] + $LMI – LOGO                                          MENU

 INPUTS    Data Entry    Eject      Quit

Print INPUTS Spreadsheet

              DC         DD         DE         DF         DG         DH         DI

949   LMI BQ-Analysis System                   22-Feb                    Version:
950   INPUTS89.WK1                      PRINT INPUTS MENU                      4.0
951
952
953                         Instructions for Print Inputs Routines
954
955        Use the right or left arrow keys and highlight the selection you wish
956        to execute.  Then press [ENTER].
957
958     INPUTS PRINT
959      COMMAND                                          EXPLANATION
960   --------------------------------------------------------------------------
961     INPUTS                 Print the INPUTS Spreadsheet on an 80-column printer.
962     DATA ENTRY             Print the INPUTS Data Entry Form.
963     EJECT                  Printer to eject to the top of the page.
964     QUIT                   Quit Print Inputs Menu and return to Inputs Menu.
965
966
967
968

22-Feb-90    08:36 AM                       CMD
```

FIG. B-9. PRINT INPUTS MENU

```
DJ929:  [W15] + $LMI – LOGO                                               MENU

  VHA     Room     Undistributed     Food     Military     Quit

Variable Housing Allowance Functions

                DJ        DK        DL        DM        DN        DO        DP

929   LMI BQ-Analysis System                   22-Feb                   Version:
930   INPUTS89.WK1                         SALARIES MENU                      4.0
931
932
933                   Instructions for the SALARIES Spreadsheet
934
935        Use the right or left arrow keys and highlight the selection you wish
936        to execute.  Then press [ENTER].
937
938        SALARIES
939        COMMAND                                    EXPLANATION
940   ---------------------------------------------------------------------------
941   VHA                     Change/view Variable Housing Allowance.
942   ROOM                    View room-related staffing in SALARIES without changing.
943   UNDISTRIBUTED           View undistributed staffing in SALARIES without changing.
944   FOOD                    View food & beverage in SALARIES without changing.
945   MILITARY                View military comparison in SALARIES without changing.
946   QUIT                    Quit this menu and return to MAIN MENU.
947
948

22-Feb-90    08:38 AM                         CMD
```

FIG. B-10. SALARIES MENU

APPENDIX C

BACHELOR QUARTERS SPREADSHEET MENUS

BACHELOR QUARTERS SPREADSHEET MENUS

```
BF997: [W15] + $LMI – LOGO                                    MENU

Combine   Browse   Print   Erase   Quit

Combine Information from INPUTS with the BQ Spreadsheet

             BF          BG          BH          BI          BJ

997   LMI BQ-Analysis System              Feb-90              Version:
998   BQ89.WK1                            MAIN MENU                  4.0
999
1000
1001                            Main Menu Instructions
1002
1003       Use the right or left arrow keys and highlight the selection you wish
1004       to execute.  Then press [ENTER].
1005
1006   MAIN MENU
1007   COMMAND                          EXPLANATION
1008 --------------------------------------------------------------------------
1009   COMBINE           Combine INPUTS Spreadsheet into BQ Spreadsheet.
1010   BROWSE            View BQ Models without making changes.
1011   PRINT             Print routines are located here.
1012   ERASE             Erase the spreadsheet and remain in 123.
1013   QUIT              Quit 123 and return to DOS (the operating system)
1014
1015
1016

22-Feb-90    11:09 AM                    CMD
```

FIG. C-1. MAIN MENU

```
BF977: [W15] + $LMI – LOGO                                    MENU

Summary   Variables   Life Cycle   Pro Forma   Quit

View Cost Comparison Summary for Each Option

            BF            BG            BH            BI            BJ

977   LMI BQ-Analysis System                  Feb-90              Version:
978   BQ89.WK1                          BROWSE MENU                   4.0
979
980
981                          Browse Menu Instructions
982
983        Use the right or left arrow keys and highlight the selection you wish
984        to execute.  Then press [ENTER].
985
986   BROWSE MENU
987     COMMAND                              EXPLANATION
988   ---------------------------------------------------------------------
989     SUMMARY          View the Cost Comparison Summary without making changes.
990     VARIABLES        View INPUTS Variables used in Cost Comparison Summary.
991     LIFE CYCLE       View the Life Cycle Costs for each Option.
992     PRO FORMA        View Pro Forma Statements for each Option.
993     QUIT             Return to  MAIN MENU.
994
995
996

22-Feb-90    11:11 AM                        CMD
```

FIG. C-2. BROWSE MENU

```
BF857:  [W15]  + $LMI – LOGO                                                    MENU

MILCON      Private Option 1       All         Quit

View Cost Comparison Summary for MILCON

              BF            BG            BH            BI            BJ

857   LMI BQ-Analysis System                Feb-90                    Version:
858   BQ89.WK1              BROWSE COST SUMMARY MENU                      4.0
859
860
861                        Browse Cost Summary Instructions
862
863      Use the right or left arrow keys and highlight the selection you wish
864      to execute.  Then press [ENTER].
865
866      BROWSE COST
867      SUMMARY COMMAND                        EXPLANATION
868   ------------------------------------------------------------------------
869      MILCON            View MILCON Cost Summary Statement.
870      OPTION 1          View Private Option 1 Cost Summary Statement.
871      ALL               View All Options.
872      QUIT              Return to BROWSE MENU.
873
874
875
876

22-Feb-90    11:12 AM                          CMD
```

FIG. C-3. BROWSE COST SUMMARY MENU

```
BF837:  [W15]  + $LMI – LOGO                                    MENU

MILCON        Private Option 1        All        Quit

View BOQ Model's INPUTS Variables for MILCON

              BF            BG           BH           BI           BJ

837   LMI BQ-Analysis System               Feb-90              Version:
838   BQ89.WK1                 BROWSE VARIABLES MENU              4 0
839
840
841                         Browse Variables Instructions
842
843       Use the right or left arrow keys and highlight the selection you wish
844       to execute.  Then press [ENTER]
845
846       BROWSE COST
847   SUMMARY COMMAND                  EXPLANATION
848   -------------------------------------------------------------------
849       MILCON          View INPUTS Variables for MILCON.
850       OPTION 1        View INPUTS Variables for Private Option 1
851       ALL             View All Options
852       QUIT            Return to BROWSE MENU.
853
854
855
856

22-Feb-90    11:13 AM                     CMD
```

FIG. C-4. BROWSE VARIABLES MENU

```
BF937:  [W15]  + $LMI – LOGO                                    MENU

MILCON      Private Option 1        Quit

View Life Cycle Costs for the MILCON Option

                BF            BG          BH           BI          BJ

937   LMI BQ-Analysis System              Feb-90                Version:
938   BQ89.WK1              BROWSE LIFE CYCLE MENU                 4.0
939
940
941                        Browse Life Cycle Instructions
942
943        Use the right or left arrow keys and highlight the selection you wish
944        to execute.  Then press [ENTER].
945
946   BROWSE LIFE CYCLE
947      COMMAND                              EXPLANATION
948   ------------------------------------------------------------------------
949      MILCON          View MILCON Life Cycle Cost Variables without changing.
950      OPTION 1        View Private Option 1 Life Cycle Cost Variables
951      QUIT            Return to BROWSE MENU.
952
953
954                              .
955
956

22-Feb-90    11:14 AM                       CMD
```

FIG. C-5. BROWSE LIFE CYCLE MENU

```
BF897:  [W15] + $LMI – LOGO                                          MENU

MILCON        Private Option 1        Quit

View Summary Pro Forma Statements for MILCON

                 BF             BG          8H           8I          8J

897   LMI BQ-Analysis System                 Feb-90                Version:
898   BQ89.WK1                    BROWSE PRO FORMA MENU                 4.0
899
900
901                         Browse Pro Forma Instructions
902
903       Use the right or left arrow keys and highlight the selection you wish
904       to execute.  Then press [ENTER].
905
906   PRINT MENU
907   COMMAND                                    EXPLANATION
908   -----------------------------------------------------------------------
909     MILCON              View MILCON Summary Pro Forma Statements.
910     OPTION 1            View Private Option 1 Summary Pro Forma Statements.
911     QUIT                Return to BROWSE MENU.
912
913
914
915
916

22-Feb-90    11:16 AM                      CMD
```

FIG. C-6. BROWSE PRO FORMA MENU

```
BF957:  [W15]  + $LMI – LOGO                                          MENU

Summary    Variables    Life Cycle    Pro Forma    Eject    Quit

Print Cost Comparison Summary for Each Option

            BF           BG           BH           BI           BJ

957   LMI BQ-Analysis System              Feb-90              Version:
958   BQ89.WK1                          PRINT MENU                    4.0
959
960
961                          Print Menu Instructions
962
963       Use the right or left arrow keys and highlight the selection you wish
964       to execute.  Then press [ENTER].
965
966   PRINT MENU
967   COMMAND                                   EXPLANATION
968   -----------------------------------------------------------------------
969   SUMMARY            Print Cost Comparison Summary on an 80-column printer.
970   VARIABLES          Print BOQ INPUTS Variables on an 80-column printer.
971   LIFE CYCLE         Print Life Cycle Costs for each option on 80 columns.
972   PRO FORMA          Print Summary Pro Forma for each option on 80 columns.
973   EJECT              Move page to the top (form feed).
974   QUIT               Return to MAIN MENU.
975
976

22-Feb-90    11:17 AM                      CMD
```

FIG. C-7. PRINT MENU

```
BF817: [W15] + $LMI – LOGO                                    MENU

MILCON      Private Option 1          All          Quit

Print Cost Comparison Summary for MILCON

                BF            BG            BH            BI            BJ

817   LMI BQ-Analysis System              Feb-90              Version:
818   BQ89.WK1                   PRINT COST SUMMARY MENU              4.0
819
820
821                     Print Cost Summary Instructions
822
823        Use the right or left arrow keys and highlight the selection you wish
824        to execute.  Then press [ENTER].
825
826        PRINT COST
827   SUMMARY COMMAND                    EXPLANATION
828   --------------------------------------------------------------------
829        MILCON          Print MILCON Cost Summary Statement.
830        OPTION 1        Print Private Option 1 Cost Summary Statement.
831         ALL            Print all options.
832        QUIT            Return to PRINT MENU.
833
834
835
836

22-Feb-90    11:18 AM                   CMD
```

FIG. C-8. PRINT COST SUMMARY MENU

```
BF797:  [W15]  + $LMI – LOGO                                          MENU

MILCON    Private Option 1          All              Quit

Print BQ Analysis Model's INPUTS Variables for MILCON

                BF            BG           BH            BI          BJ

797    LMI BQ-Analysis System               Feb-90              Version:
798    BQ89.WK1              PRINT INPUTS VARIABLES MENU              4.0
799
800
801                       Print INPUTS Variables Instructions
802
803       Use the right or left arrow keys and highlight the selection you wish
804       to execute.  Then press [ENTER].
805
806       PRINT INPUTS
807    VARIABLES COMMAND                EXPLANATION
808    ----------------------------------------------------------------------
809       MILCON               Print MILCON INPUTS.
810       OPTION 1             Print Private Option 1 INPUTS.
811       ALL                  Print all INPUTS.
812       QUIT                 Return to PRINT MENU.
813
814
815
816

22-Feb-90    11:20 AM                      CMD
```

FIG. C-9. PRINT INPUTS VARIABLES MENU

```
BF917: [W15] + $LMI – LOGO                                          MENU

MILCON   Private Option 1          Quit

Print Life Cycle Costs for the MILCON Option

              BF          BG          BH          BI          BJ

917  LMI BQ-Analysis System              Feb-90              Version:
918  BQ89.WK1             PRINT LIFE CYCLE MENU                 4.0
919
920
921                       Print Life Cycle Instructions
922
923        Use the right or left arrow keys and highlight the selection you wish
924        to execute.  Then press [ENTER].
925
926     PRINT LIFE CYCLE
927        COMMAND                         EXPLANATION
928  --------------------------------------------------------------------------
929        MILCON              Print MILCON Life Cycle Costs.
930        OPTION 1            Print Private Option 1 Life Cycle Costs.
931         QUIT               Return to PRINT MENU.
932
933
934
935
936

     22-Feb-90   11:22 AM                    CMD
```

FIG. C-10. PRINT LIFE CYCLE MENU

```
BF877:  [W15] + $LMI – LOGO                                          MENU

MILCON        Private Option 1          Quit

Print Pro Forma Summary Statements for the MILCON Option

              BF            BG            8H           BI           8J

877   LMI BQ-Analysis System                 Feb-90                Version:
878   BQ89.WK1                  PRINT PRO FORMA MENU                   4.0
879
880
881                          Print Pro Forma Instructions
882
883       Use the right or left arrow keys and highlight the selection you wish
884       to execute.  Then press [ENTER].
885
886   PRINT PRO FORMA
887      COMMAND                              EXPLANATION
888   ------------------------------------------------------------------------
889       MILCON            Print MILCON Summary Pro Forma Statements.
890       OPTION 1          Print Private Option 1 Summary Pro Forma Statements.
891       QUIT              Return to PRINT MENU.
892
893
894
895
896

22-Feb-90   11:23 AM                         CMD
```

FIG. C-11. PRINT PRO FORMA MENU

APPENDIX D

MODEL INPUTS FORM

MODEL INPUTS FORM

LMI BQ–Analysis System   22–Feb   Version:
INPUTS89.WK1   PROJECT, GUARANTEED OCCUPANCY   4.0
           AND LOAN FACTORS DATA ENTRY FORM

======= PROJECT FACTORS ==
     OFFICER/ENLISTED (O/E) |_____|
     IF OFFICER, TDY OFFICERS PER DIEM |_____|
         PERMANENT PARTY OFF. BAQ & VHA |_____|
     IF ENLISTED, AVG E1–4 BAQ & VHA (no dep) |_____|
         AVG E5+ BAQ & VHA (no dep) |_____|
======== OCCUPANCY/LOAN FACTORS ==================================
     IS OCCUPANCY RATE GUARANTEED (Y/N)? |_____|
     GUARANTEED OCCUPANCY RATE |_____|
     LOAN AMOUNT (100% GUARANTEED, 75% IF NOT)   ···········
     MORTGAGE/BOND RATE * |_____|
     PROFIT RATE ON EQUITY, BEFORE TAXES   ···········
        *   IF GUARANTEED OCCUPANCY RATE <= 75%
            ENTER MORTGAGE RATE (11–18%)
          ELSE
            ENTER BOND RATE (7–11%)

LMI BQ–Analysis System   22–Feb   Version:
INPUTS89.WK1   SPECIAL FACTORS ENTRY FORM   4.0
—— PRIVATE-SECTOR ——

COST PER SQUARE FOOT |	BASIC ALLOWANCE FOR SUBSISTENCE
BY RESIDENT TYPE |	OFFICERS ··········· /MO
	ENLISTED ·········· /DA

RESIDENT	COST PER |	
TYPE	SQ. FOOT |	MILCON BUILDING CONSTRUCTION COSTS
================ ====== ==	====== ====== ========= ======
TDY-TRANSIENT |_____|	SUPPORT & SITE |_____|
PP-PERM. PART |_____|	SPECIAL |_____|
ENLISTED 1 |_____|	
ENLISTED 2 |_____|	TOTAL ···········
OTHR AUTH USE |_____|	

====== ====== ========= ======
ANNUAL CONTRACT MGMT COST

DAVIS-BACON ACT ADJUSTMENT   ====== ====== ========= ======
============== ========== |----- OTHER VENDING REVENUES -----|
DOES THE DAVIS-BACON ACT   REVENUES SWITCH (Y/N)?
APPLY (Y/N) ? |_____| |_____|

```
22-Feb  VHA DATA
09:23:07  FORM
=======  =======
RANK      VHA
=======  =======
O-10     |_____|
O-9      |_____|
O-8      |_____|
O-7      |_____|
O-6      |_____|
O-5      |_____|
O-4      |_____|
O-3      |_____|
O-2      |_____|
O-1      |_____|
O-3 E    |_____|
O-2 E    |_____|
O-1 E    |_____|
W-4      |_____|
W-3      |_____|
W-2      |_____|
W-1      |_____|
E-9      |_____|
E-8      |_____|
E-7      |_____|
E-6      |_____|
E-5      |_____|
E-4      |_____|
E-3      |_____|
E-2      |_____|
E-1      |_____|
```

MODEL INPUTS AND DEFAULT VALUES

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX   XXXXXXXXXX XXXXXXXXXX

INPUT INFORMATION	MILCON INPUTS	OPTION 1 INPUTS
LOCATION	|_____|	··········
TRANSIENT OFFICERS' ROOMS	|_____|	··········
PERM PARTY OFFICERS' ROOMS	|_____|	··········
ENLISTED 1 (E1–4) MODULES	|_____|	··········
ENLISTED 2 (E5 & ABOVE) MODULES	|_____|	··········
EXPECTED OCCUPANCY RATE	|_____|	|_____|
NUMBER OF NONAVAILABILITIES (ANNUAL)	|_____|	··········
PER DIEM RATE OR BAQ & VHA DAILY RATE	··········	··········
BUILDING COST	|_____|	··········
LAND COST	|_____|	|_____|
SUPPORT, SITE & SPEC. CONSTRUCTION COSTS	··········	··········
COST PER SF	··········	··········
GROSS BUILDING SF	··········	··········
REAL ESTATE AND PROPERTY TAX RATE	|_____|	··········
RESERVED	··········	··········
ANNUAL TRANSPORTATION COST	|_____|	|_____|
PROFIT RATE ON EQUITY, BEFORE TAXES	··········	··········
TANGIBLE PERSONAL PROPERTY (RESTAURANT)	|_____|	|_____|
GUARANTEED OCCUPANCY RATE	··········	··········
OTHER INPUT INFORMATION ————————	————————	————————
CURRENT YEAR FOR INPUT DATA (MODEL YR)	··········	··········
INTEREST RATE	··········	··········
CONTRACT TERM	··········	|_____|
DISCOUNT RATE	··········	··········
BASE YEAR FOR PROJECT START	|_____|	··········
ROOMS TO RESTAURANT SEATS RATIO	··········	··········
FOOD SALES	··········	··········
PERCENT BEVERAGE TO FOOD	··········	··········
COIN LAUNDRY REVENUE	··········	··········
OTHER VENDING REVENUE	··········	··········
ROOMS EXPENSE: LINEN	|_____|	··········
ROOMS EXPENSE: OPERATING SUPPLIES	|_____|	··········
ROOMS EXPENSE: LAUNDRY AND DRY CLEANING	|_____|	··········
ROOMS EXPENSE: OTHER	|_____|	··········
TOTAL ROOMS EXPENSE RATIO	··········	··········
FIXED ROOMS EXPENSE AT ANY OCCUPANCY	··········	··········
F&B EXPENSE RATIO, NON–PAYROLL	|_____|	··········
FIXED F&B EXPENSE AT ANY OCCUPANCY	|_____|	··········

ADMINISTRATIVE & GENERAL ....
MANAGEMENT FEE — ....
PROPERTY OPERATIONS & MAINTENANCE |_____| ....
PERCENTAGE NUMBER OF WASHERS AND DRYERS |_____| ....
LAUNDRY MAINTENANCE |_____| ....
ENERGY EXPENSE |_____| ....
BUILDING, CONTENT & LIABILITY INSURANCE ....
GROUND RENT ....

POST CONTRACT AWARD SUPPORT |_____| ....
DESIGN COST ....
CONTINGENCY ....
SITE INSPECTION AND OVERHEAD ....
TANGIBLE PERSONAL PROPERTY TRANSIENT OFFS. |_____| ....
TANGIBLE PERSONAL PROPERTY PERM PARTY OFFS. |_____| ....
TANGIBLE PERSONAL PROPERTY ENLISTED 1 |_____| ....
TANGIBLE PERSONAL PROPERTY ENLISTED 2 |_____| ....

LOAN AMOUNT ....
LOAN AMORTIZATION PERIOD .... |_____|

MAINTENANCE ANNUAL INCREASE ....
REAL ESTATE TAX ANNUAL INCREASE ....
BUILDING ANNUAL DEPRECIATION ....
LAND ANNUAL APPRECIATION ....

TRANSIENT OFFICERS–GROSS SF/ROOMS |_____| ....
PERM PARTY OFFICERS–GROSS SF/ROOMS |_____| ....
ENLISTED 1 (E1–4)–GROSS SF/MODULE |_____| ....
ENLISTED 2 (E5 & ABOVE)–GROSS SF/MODULE |_____| ....

FROM SALARIES MODULES

ROOM EXPENSE: PAYROLL ....
UNDISTRIBUTED: PAYROLL ....
RESTAURANT: PAYROLL ....

ESTIMATE–OTHER AUTH USERS, ANNUAL NIGHTS .... |_____|
PERCENTAGE OF POTENTIAL GUESTS, PER DAY .... |_____|
OTHER AUTH USERS ROOMS PER DAY ....
OTHER AUTH USERS ROOM RATE ....
OTHER AUTH USERS (%) OF TOTAL ROOMS ....
OTHER AUTH USERS GROSS SF PER ROOM ....
OTHER AUTH USERS TRANSIENT PERSONAL PROP. .... |_____|

APPENDIX E

TUTORIAL DATA ENTRY FORM

TUTORIAL DATA ENTRY FORM

LMI BQ-Analysis System   22-Feb   Version:
INPUTS89.WK1   PROJECT, GUARANTEED OCCUPANCY   4.0
          AND LOAN FACTORS DATA ENTRY FORM

========= PROJECT FACTORS ===
- OFFICER/ENLISTED (O/E) | _____O_ |
- IF OFFICER, TDY OFFICERS PER DIEM | _____75_ |
- PERMANENT PARTY OFF. BAQ & VHA | _____ |
- IF ENLISTED, AVG E1-4 BAQ & VHA (no dep) | _____ |
- AVG E5+ BAQ & VHA (no dep) | _____ |

========= OCCUPANCY/LOAN FACTORS ==
- IS OCCUPANCY RATE GUARANTEED (Y/N)? | ____Y__ |
- GUARANTEED OCCUPANCY RATE | __90 %_ |
- LOAN AMOUNT (100% GUARANTEED, 75% IF NOT) · · · · · · · · · · ·
- MORTGAGE/BOND RATE * | ___8 %_ |
- PROFIT RATE ON EQUITY, BEFORE TAXES · · · · · · · · · · ·

      * IF GUARANTEED OCCUPANCY RATE <= 75%
          ENTER MORTGAGE RATE (11-18%)
        ELSE
          ENTER BOND RATE (7-11%)

LMI BQ-Analysis System   22-Feb   Version:
INPUTS89.WK1   SPECIAL FACTORS ENTRY FORM   4.0

---- PRIVATE-SECTOR ----

COST PER SQUARE FOOT | BASIC ALLOWANCE FOR SUBSISTENCE
 BY RESIDENT TYPE | OFFICERS · · · · · · · · · · · /MO
                      ENLISTED · · · · · · · · · · · /DA

RESIDENT TYPE	COST PER SQ. FOOT
TDY-TRANSIENT	76.67
PP-PERM. PART	81.50
ENLISTED 1	78.33
ENLISTED 2	78.33
OTHR AUTH USE	76.67

MILCON BUILDING CONSTRUCTION COSTS

SUPPORT & SITE	1,462,000
SPECIAL	1,991,000
TOTAL	· · · · · · · · · · ·

ANNUAL CONTRACT MGMT COST

DAVIS-BACON ACT ADJUSTMENT

| ------ OTHER VENDING REVENUES ------ |

DOES THE DAVIS-BACON ACT   REVENUES SWITCH (Y/N)?
APPLY (Y/N) ? | __N__ | | __Y__ |

RANK	VHA
O-10	487.70
O-9	487.70
O-8	487.70
O-7	487.70
O-6	513.48
O-5	519.06
O-4	524.07
O-3	494.67
O-2	439.62
O-1	441.96
O-3 E	476.23
O-2 E	465.93
O-1 E	449.94
W-4	503.06
W-3	508.42
W-2	489.84
W-1	464.19
E-9	405.58
E-8	443.98
E-7	373.05
E-6	367.33
E-5	349.38
E-4	296.04
E-3	292.15
E-2	295.07
E-1	285.22

MODEL INPUTS AND DEFAULT VALUES

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXX XXXXXXXXXXX

INPUT INFORMATION	MILCON INPUTS	OPTION 1 INPUTS
LOCATION	MARYLAND	....
TRANSIENT OFFICERS' ROOMS	150	....
PERM PARTY OFFICERS' ROOMS	0	....
ENLISTED 1 (E1–4) MODULES	0	....
ENLISTED 2 (E5 & ABOVE) MODULES	0	....
EXPECTED OCCUPANCY RATE	95 %	95 %
NUMBER OF NONAVAILABILITIES (ANNUAL)	48,282	....
PER DIEM RATE OR BAQ & VHA DAILY RATE	....	....
BUILDING COST	6,005,000	....
LAND COST	0	0
SUPPORT, SITE & SPEC. CONSTRUCTION COSTS	....	....
COST PER SF	....	....
GROSS BUILDING SF	....	....
REAL ESTATE AND PROPERTY TAX RATE	2.63%	....
RESERVED	....	....
ANNUAL TRANSPORTATION COST	0	0
PROFIT RATE ON EQUITY, BEFORE TAXES	....	....
TANGIBLE PERSONAL PROPERTY (RESTAURANT)	0	0
GUARANTEED OCCUPANCY RATE	....	....
OTHER INPUT INFORMATION ————————		
CURRENT YEAR FOR INPUT DATA (MODEL YR)	....	....
INTEREST RATE	....	....
CONTRACT TERM	....	32
DISCOUNT RATE	....	....
BASE YEAR FOR PROJECT START	1991	....
ROOMS TO RESTAURANT SEATS RATIO	....	....
FOOD SALES	....	....
PERCENT BEVERAGE TO FOOD	....	....
COIN LAUNDRY REVENUE	....	....
OTHER VENDING REVENUE	....	....
ROOMS EXPENSE: LINEN	Default	....
ROOMS EXPENSE: OPERATING SUPPLIES	Default	....
ROOMS EXPENSE: LAUNDRY AND DRY CLEANING	Default	....
ROOMS EXPENSE: OTHER	Default	....
TOTAL ROOMS EXPENSE RATIO	....	....
FIXED ROOMS EXPENSE AT ANY OCCUPANCY	....	....
F&B EXPENSE RATIO, NON-PAYROLL	0	....
FIXED F&B EXPENSE AT ANY OCCUPANCY	0	....

ADMINISTRATIVE & GENERAL	· · · · · · · · · ·	· · · · · · · · · ·
MANAGEMENT FEE	· · · · · · · · · ·	· · · · · · · · · ·
PROPERTY OPERATIONS & MAINTENANCE	309	· · · · · · · · · ·
PERCENTAGE NUMBER OF WASHERS AND DRYERS	0	· · · · · · · · · ·
LAUNDRY MAINTENANCE	757	· · · · · · · · · ·
ENERGY EXPENSE	919	· · · · · · · · · ·
BUILDING, CONTENT & LIABILITY INSURANCE	· · · · · · · · · ·	· · · · · · · · · ·
GROUND RENT	· · · · · · · · · ·	· · · · · · · · · ·
POST CONTRACT AWARD SUPPORT	0.04	· · · · · · · · · ·
DESIGN COST	· · · · · · · · · ·	· · · · · · · · · ·
CONTINGENCY	· · · · · · · · · ·	· · · · · · · · · ·
SITE INSPECTION AND OVERHEAD	· · · · · · · · · ·	· · · · · · · · · ·
TANGIBLE PERSONAL PROPERTY TRANSIENT OFFS.	3,600	· · · · · · · · · ·
TANGIBLE PERSONAL PROPERTY PERM PARTY OFFS.	3,200	· · · · · · · · · ·
TANGIBLE PERSONAL PROPERTY ENLISTED 1	3,200	· · · · · · · · · ·
TANGIBLE PERSONAL PROPERTY ENLISTED 2	3,400	· · · · · · · · · ·
LOAN AMOUNT	· · · · · · · · · ·	· · · · · · · · · ·
LOAN AMORTIZATION PERIOD	· · · · · · · · · ·	32
MAINTENANCE ANNUAL INCREASE	· · · · · · · · · ·	· · · · · · · · · ·
REAL ESTATE TAX ANNUAL INCREASE	· · · · · · · · · ·	· · · · · · · · · ·
BUILDING ANNUAL DEPRECIATION	· · · · · · · · · ·	· · · · · · · · · ·
LAND ANNUAL APPRECIATION	· · · · · · · · · ·	· · · · · · · · · ·
TRANSIENT OFFICERS–GROSS SF/ROOMS	402	· · · · · · · · · ·
PERM PARTY OFFICERS–GROSS SF/ROOMS	495	· · · · · · · · · ·
ENLISTED 1 (E1–4)–GROSS SF/MODULE	765	· · · · · · · · · ·
ENLISTED 2 (E5 & ABOVE)–GROSS SF/MODULE	765	· · · · · · · · · ·

FROM SALARIES MODULES

ROOM EXPENSE: PAYROLL	· · · · · · · · · ·	· · · · · · · · · ·
UNDISTRIBUTED: PAYROLL	· · · · · · · · · ·	· · · · · · · · · ·
RESTAURANT: PAYROLL	· · · · · · · · · ·	· · · · · · · · · ·

ESTIMATE–OTHER AUTH USERS, ANNUAL NIGHTS	· · · · · · · · · ·	73,000
PERCENTAGE OF POTENTIAL GUESTS, PER DAY	· · · · · · · · · ·	5%
OTHER AUTH USERS ROOMS PER DAY	· · · · · · · · · ·	· · · · · · · · · ·
OTHER AUTH USERS ROOM RATE	· · · · · · · · · ·	· · · · · · · · · ·
OTHER AUTH USERS (%) OF TOTAL ROOMS	· · · · · · · · · ·	· · · · · · · · · ·
OTHER AUTH USERS GROSS SF PER ROOM	· · · · · · · · · ·	· · · · · · · · · ·
OTHER AUTH USERS TRANSIENT PERSONAL PROP.	· · · · · · · · · ·	3,894

APPENDIX F

INPUTS PRINTOUT

INPUTS PRINTOUT

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

INPUT INFORMATION	MILCON INPUTS	ON-BASE OPTION 1 INPUTS
1 LOCATION	MARYLAND	MARYLAND
2 TRANSIENT OFFICERS' ROOMS	150	150
3 PERM PARTY OFFICERS' ROOMS	0	0
4 ENLISTED 1 (E1-4) MODULES	0	0
5 ENLISTED 2 (E5 & ABOVE) MODULES	0	0
6 EXPECTED OCCUPANCY RATE	95%	95%
7 NUMBER OF NONAVAILABILITIES (ANNUAL)	482820	482820
8 PER DIEM RATE OR BAQ & VHA DAILY RATE	$75	$75
9 BUILDING COST	$6,005,000	$4,931,414
10 LAND COST	$0	$0
11 SUPPORT, SITE & SPEC. CNSTRUCTION COSTS	$3,453,000	$2,025,996
12 COST PER SF	$100	$77
13 GROSS BUILDING SF	60300	64320
14 REAL ESTATE AND PROPERTY TAX RATE	2.63%	2.63%
15 RESERVED	$0	$30
16 ANNUAL TRANSPORTATION COST	$0	$0
17 PROFIT RATE ON EQUITY, BEFORE TAXES	0.00%	15.00%
18 TANGIBLE PERSONAL PROPERTY (RESTAURANT)	$0	$0
19 GUARANTEED OCCUPANCY RATE	0%	90%
--- OTHER INPUT INFORMATION		
1 CURRENT YEAR FOR INPUT DATA (MODEL YR)	1989	1989
2 INTEREST RATE	0.00%	8.00%
3 CONTRACT TERM	32	32
4 DISCOUNT RATE	10.0%	10.0%
BASE YEAR FOR PROJECT START	1991	1991
5 ROOMS TO RESTAURANT SEATS RATIO	0.00	0.00
6 FOOD SALES	$0	$0
7 PERCENT BEVERAGE TO FOOD	0.00	0.00
8 COIN LAUNDRY REVENUE		
9 OTHER VENDING REVENUE	$0.00	$0.18
10 ROOMS EXPENSE: LINEN	$0.13	$0.51
11 ROOMS EXPENSE: OPERATING SUPPLIES	$0.48	$0.15
12 ROOMS EXPENSE: LAUNDRY & DRY CLEANING	$0.00	$0.19
13 ROOMS EXPENSE: OTHER	$0.90	$0.27
14 TOTAL ROOMS EXPENSE RATIO	0.000	0.197
15 FIXED ROOMS EXPENSE AT ANY OCCUPANCY	0.00	0.28
16 F&B EXPENSE RATIO, NON-PAYROLL	0.00	0.00

17 FIXED F&B EXPENSE AT ANY OCCUPANCY	0.00	0.62
18 ADMINISTRATIVE & GENERAL	$0	$331
19 MANAGEMENT FEE	0%	4%
20 PROPERTY OPERATIONS & MAINTENANCE	$309	$348
21 PERCENTAGE NUMBER OF WASHERS AND DRYERS	0%	6%
22 LAUNDRY MAINTENANCE	$7.57	$7.87
23 ENERGY EXPENSE	$919	$919
24 BUILDING, CONTENT & LIABILITY INSURANCE	287	287
25 GROUND RENT	$0	$1,350
POST CONTRACT AWARD SUPPORT	0.04	0.00
26 DESIGN COST	0.07	0.00
27 CONTINGENCY	0.06	0.00
28 SITE INSPECTION AND OVERHEAD	0.062	0.000
29 TANGIBLE PERSONAL PROPERTY TRANSIENT OFFS.	$3,600	$3,600
30 TANGIBLE PERSONAL PROPERTY PERM PARTY OFFS	$3,200	$3,200
31 TANGIBLE PERSONAL PROPERTY ENLISTED 1	$3,200	$3,200
32 TANGIBLE PERSONAL PROPERTY ENLISTED 2	$3,400	$3,400
33 LOAN AMOUNT	0%	103%
34 LOAN AMORTIZATION PERIOD	0	32
35 MAINTENANCE ANNUAL INCREASE	1.69%	1.50%
36 REAL ESTATE TAX ANNUAL INCREASE	1.12%	1.00%
37 BUILDING ANNUAL DEPRECIATION	2.50%	2.50%
38 LAND ANNUAL APPRECIATION	1.69%	1.50%
39 TRANSIENT OFFICERS-GROSS SF/ROOMS	402	402
40 PERM PARTY OFFICERS-GROSS SF/ROOMS	495	495
41 ENLISTED 1 (E1-4)-GROSS SF/MODULE	765	765
42 ENLISTED 2 (E5 & ABOVE)-GROSS SF/MODULE	765	765

FROM SALARIES MODULES

43 ROOM EXPENSE: PAYROLL	$0	$298,353
44 UNDISTRIBUTED: PAYROLL	$287,773	$149,185
45 RESTAURANT: PAYROLL	$0	$0

---

46 ESTIMATE-OTHER AUTH USERS, ANNUAL NIGHTS	0	73000
47 PERCENTAGE OF POTENTIAL GUESTS, PER DAY	0%	5%
48 OTHER AUTH USERS ROOMS PER DAY	0	10
49 OTHER AUTH USERS ROOM RATE	$0	$30
50 OTHER AUTH USERS (%) OF TOTAL ROOMS	0.0%	6.7%
51 OTHER AUTH USERS GROSS SF PER ROOM	0	402
52 OTHER AUTH USERS TRANSIENT PERSONAL PROP.	$0	$3,894

ANNUAL OTHER OCCUPANT INCOME	$0	$109,500

APPENDIX G

COST SUMMARY REPORTS

COST SUMMARY REPORTS

TABLE G-1

COST SUMMARY REPORTS

Cost comparison summary	04-Mar 15:06	MILCON
Total cost NPV		$20,458,015
Total revenue NPV	(other authorized users)	$0
Total adjusted NPV % of MILCON NPV		$20,458,015
Starting RM rate SRR (low) SRR (high)		
Cost comparison summary	04-Mar 15:06	OPTION 1 ON-BASE
Total cost NPV		$20,291,063
Total revenue NPV	(other authorized users)	$1,428,055
Total adjusted NPV % of MILCON NPV		$18,863,008 92%
Starting RM rate SRR (low) SRR (high)		 $31 $39

Note: MILCON – military construction; NPV – net present value; RM – room; and SRR – starting RM rate

APPENDIX H

ASSUMPTIONS, DEFINITIONS, AND MODEL INPUTS IN THE BACHELOR QUARTERS ANALYSIS SYSTEM

ASSUMPTIONS, DEFINITIONS, AND MODEL INPUTS IN THE BACHELOR QUARTERS ANALYSIS SYSTEM

The Bachelor Quarters Analysis System (BAS) is based primarily on actual private-sector and military construction (MILCON) program data. However, construction of the model required a number of assumptions; this appendix describes them. Most of the assumptions are straightforward. However, some require an explanation of the rationale behind them.

The assumptions in the model were not made arbitrarily. For the most part, their source was the consultant team at Panell, Kerr, and Forster (PKF), Certified Public Accountants. The PKF staff drew on their extensive background in the hospitality industry to provide us with realistic assumptions based on their experience in developing dozens of economic feasibility studies for individual hotel projects in the private and public sectors. In addition to PKF, we talked to or met with representatives of several national hotel chains, several large builders, and real estate developers. Finally, assumptions about the military construction program were ably provided by the Naval Facilities Engineering Command (NAVFAC) and were used in conjunction with our own extensive knowledge of MILCON.

A number of the assumptions are purely economic and were provided by the Logistics Management Institute (LMI). LMI has been examining the issue of public/private ventures (P/PVs) for DoD and the Military Services for several years. Team members from the various projects at LMI have held long internal discussions of the economic issues related to P/PV projects; LMI also held meetings with NAVFAC, DoD, and the Office of Management and Budget (OMB) staff regarding these issues. The economic assumptions in the model reflect not only what the administration and Congress require, but economic reality as well.

Sensitivity analyses of the assumptions were performed during the project to determine the nature and size of variations in the assumptions on the economic outputs of the model. The results of these sensitivity analyses were used to develop the Decision Guide for P/PVs in Navy Bachelor Quarters (BQs).

LEASE VERSUS BUY ANALYSIS, DISCOUNT, AND INFLATION RATES

The model follows the basic guidelines set forth in OMB Circular No. A-104, *Analysis of Lease Versus Buy Alternatives*. A-104 requires that the Government alternative (i.e., MILCON) be compared with leasing options [e.g., P/PVs in Bachelor Officers Quarters (BOQs)] in specific ways. First, A-104 requires that future cash flows projected from current-year dollars be inflated at official Government rates of inflation. Therefore, current-year expenses and revenues were inflated by official DoD inflation rates to obtain out-year estimates of life-cycle costs.

Second, A-104 requires that future-year cash flows be discounted to present values, and that the net present value (NPV) of alternatives be calculated for the entire life of the proposed project. A-104 requires the use of a discount rate equal to the current yield on Treasury securities having the same term as the proposed project (e.g., 20 years) plus one-eighth of 1 percent. However, LMI's discussions with OMB resulted in the conclusion that "risk premiums" could be added to this discount rate to reflect the economic realities of the proposed project. During the course of the project, yields on 20-year Treasury securities were in the 8 to 9 percent range. Given the fact that P/PVs in the military are a new phenomenon, and that no market currently exists for handling the debt instruments (e.g., mortgages and bonds) entailed by such ventures, we have assumed a risk premium of 1 percent. The discount rate used in the model to determine life-cycle costs is therefore 10 percent.

The model calculates total costs for each year of the contract term (20 to 40 years, as selected by the user). The NPV of annual costs is then calculated, followed by the cumulative NPV of costs for the MILCON and P/PV options. These life-cycle costs can be viewed on the screen and can also be printed.

INPUT ASSUMPTIONS

Most of the other assumptions relate directly to the expenses of constructing or operating a bachelor housing facility. We discuss each of them in the order in which they appear in the input segment of the model. The assumptions hold for both officer and enlisted quarters unless otherwise noted. Nearly all the inputs for the MILCON alternative come from three sources: a DD Form 1391, *Military Construction Project Data*, for the project, other user-calculated/estimated data, and assumptions made for the BAS Model (which are not allowed to be changed by the user). If the activity has not prepared a DD Form 1391, for example, because a MILCON project has not been

proposed, it would be a good idea to generate the cost estimates that would go on a DD Form 1391. All of the MILCON construction costing for BAS inputs requires such estimates.

Public/Private Venture Options

Both on- and off-base P/PV options are allowed by the model. This selection by the user affects certain internally calculated costs and other costs which must be input differently, for on- and off-base alternatives: land cost, real estate and property taxes, support and site costs, and special construction factors.

Required Number of Rooms/Modules

The model assumes that permanent party and transient officer rooms can both be constructed within a single BOQ, and that both enlisted E1 −E4 and E5 and above rooms also can be constructed within a single Bachelor Enlisted Quarters (BEQ), but that enlisted and officer rooms will not be mixed in the same physical facility. The model assumes that different net room/module square footages will be constructed for the different groups and uses the ratio of the number of each type of room to the total number of rooms for many internal calculations. For example, total gross building square footage and linen costs (only TDY rooms have maid service) are affected by this ratio.

There is only one officer to a room in a BOQ. The number of required rooms for officers equals the number of officers being housed. This number should be derived on the basis of the accepted DoD procedures for determining berthing construction requirements that would normally accompany a DD Form 1391 MILCON budget submission. However, there would normally be more than one enlisted person to a room in a BEQ. The model assumes that BEQs are arranged as modules, with two rooms and one bath per module. Each room within a module may house a maximum of two E1 −E4 personnel or one E5 or E6 person. For example, 180 BEQ modules would house up to 720 E1 −E4 persons (four per module, two per room). It is important that the user input the number of *modules*, not the number of rooms or personnel to be housed, for the model to provide correct estimates. The requirement for the number of modules should also be derived on the basis of the accepted DoD procedures for determining berthing construction requirements that would normally accompany a DD Form 1391 MILCON budget submission.

Expected Occupancy Rate

The average annual occupancy rate that the base expects to achieve for the facility is the "expected occupancy rate." This rate should be less than 100 percent since some nights some rooms will be vacant. However, given an adequate requirement and good housing office management, it is not unreasonable to expect an occupancy rate in the 95 to 99 percent range. The occupancy rate is used in numerous internal calculations. For example, many of the rooms' expense figures discussed below are based on a calculation of *occupied* rooms instead of available (constructed) rooms. Finally, the expected occupancy rate should not be confused with the guaranteed occupancy rate discussed below. The expected occupancy rate should always be at least equal to (and probably higher than) the guaranteed occupancy rate if there is going to be a guarantee.

Number of Nonavailabilities (Annual) and Per Diem Rate

This is the total number of *nights* of nonavailability issued by the base in a recent representative 12-month period. The figure should be only for officers when running a BOQ model and only for enlisted personnel when running a BEQ model. The BAS Model uses this number to calculate the maximum per diem savings to allocate to the privatized BQ in its first year of operation since the P/PV BQ is assumed to come on line 1 year sooner than a comparable MILCON BQ.

The per diem rate is for lodging only and is used in the calculation of first-year per diem savings for the P/PV BQ. (The difference between the estimated P/PV room rate and the lodging per diem rate is the per room, per night savings.)

Building Cost

This is the facility construction cost developed for the DD Form 1391, including structural equipment (e.g., heating and cooling). (Note: The facility construction cost should be in base-year dollars for the project start.) It does not include furniture and fixtures for the individual rooms. For the private-sector options, this cost is calculated internally by the model, as explained later. Nor does it include design, special construction factors, site costs, supervision inspection and overhead (SIOH), or contingency. All of these costs are input later in the model for MILCON and added to the building cost to give total construction cost.

The P/PV building costs are calculated internally by the model in the following manner:

- Cost per gross square foot is obtained for the P/PV from a reliable commercial publication — we recommend that the Marshall Commercial Service be used — for a Class B Average Hotel/Dormitory. (There is a geographic region adjustment factor.) This is the industry standard comparable to a military BQ facility. This cost per square foot for the P/PV is entered into the BAS Model by the user.

- The private-sector cost per gross square foot is a "total delivered cost," which includes design, SIOH, contingency, and site preparation. However, special construction factors are not included in this private-sector cost. Therefore, the model first calculates the P/PV cost as the product of cost per gross square foot times the number of gross square feet (equal to the MILCON gross square footage). The model then computes the ratio of this P/PV estimate with the MILCON "total delivered cost excluding Special Construction Factors costs." This ratio represents P/PV total construction costs as a percent of MILCON total construction costs, excluding special construction factors. This percentage of MILCON estimated special construction factors is then added to the P/PV cost to yield the final P/PV total construction cost estimate in the model. The user will see these total construction costs for MILCON and the P/PV in the Life-Cycle Cost Tables section of the model's output.

Land Cost

If off-base P/PV options are considered, the cost of the off-base land suitable for the same size facility is input for the particular P/PV option(s). The applicable Engineering Field Division (EFD) should assist the activity in generating this value.

Support, Site, and Special Construction Factors Costs

These are the estimated costs that are (or would be) on the DD Form 1391 for the MILCON option and are input by the user. P/PV costs for this item are internally calculated as discussed above.

Cost Per Square Foot

This is an internally generated number for the MILCON option. It is calculated by dividing total construction costs by the total gross square footage of the facility. Total gross square footage comes from the DD Form 1391 and includes all hallways,

common areas, storage rooms, and mechanical areas. This estimate should be consistent with the net square footage for quarters that the user inputs later.

Cost per square foot for the P/PV options is input by the user. The source must be a commercial publication such as Marshall Commercial Service or Means Square Foot Cost Estimating Guide. We recommend using the Marshall Commercial Service because it is commonly used by the hotel/dormitory industry and is well understood by the industry. It is also the source we used in developing the model and, like all estimating guides, contains inherent assumptions on what the square foot costs contain. In Marshall's, for instance, design costs and general site development to the property line are included. In other guides they may not be. Therefore, the square foot cost for a Class B Average Hotel/Dormitory from Marshall's should be used, along with any applicable regional adjustment and current cost multipliers (also in Marshall's).

Gross Building Square Footage

The MILCON gross square footage comes from the DD Form 1391 and is input by the user. The gross square footage for the P/PV options is calculated internally by the model from the MILCON gross square footage to ensure that like facilities are being compared.

Real Estate and Property Tax Rate

This should be obtained directly from the local taxing authority. Local tax rates are usually a rate applied to "assessed value." Local property taxes must be paid by the contractor, even for P/PVs on base. The model assumes that the rate is constant over the life of the contract and applies the rate to the total construction costs plus tangible personal property. For off-base options, the rate is also applied to land costs.

Annual Transportation Cost

For off-base P/PV options, this is the cost of transportation to and from the base, provided either by the military or by the contractor and paid for by the military in any way.

Profit Rate on Equity, Before Taxes

This is not a user input. The model generally assumes that a 15 percent profit rate on any equity capital invested by the contractor is necessary. For example,

provision of P/PV BOQs with no occupancy guarantees will force the contractor to use conventional mortgage financing, which typically requires a 20 to 25 percent down payment of equity capital on the part of the contractor.

Tangible Personal Property (Restaurant)

In general, restaurants in Navy BQ facilities are not expected to make money. Therefore, the model assumes no restaurant facilities, and these values are not input. However, the model has the capability of including restaurant costs and revenues for the contractor in the P/PV. Realistic input figures for a P/PV restaurant are provided in Appendix I, if the activity desires to estimate the effect (generally negative) of including restaurant facilities.

Guaranteed Occupancy Rate

This is the *average quarterly* occupancy rate that the activity feels it can safely guarantee. For example, for a transient BOQ facility, the officers pay the contractor directly for actual nights of lodging; any deficit in the actual occupancy compared to the guaranteed occupancy would have to be made up by the host activity in the form of a lump-sum payment to the contractor. The model uses the guaranteed occupancy rate to determine the management fee (another form of profit discussed below); higher occupancy guarantee levels result in lower management fees calculated by the model.

Guaranteed occupancy rate should not be confused with expected occupancy rate discussed above.

Current Year

The model uses this for labeling of outputs for the contract period selected. The current year is determined by the model version (i.e., INPUTS89 has a current year of 1989).

Interest Rate

This is the interest rate that the user inputs for P/PV options, and the rate must be consistent with other parameters the user inputs. Specifically, if there are occupancy guarantees, then bond financing is assumed to be available to the contractor at an interest rate considerably lower than conventional mortgage financing rates. The user is instructed to input a bond rate between 7 and 11 percent

for projects with occupancy guarantees, and a conventional mortgage rate between 11 and 17 percent for projects with no occupancy guarantees. The specific rate input by the user will depend on economic conditions, which determine interest rates in general. The activity should consult with the EFD to determine an appropriate rate. (Note: The results of the model are highly sensitive to the selection of an interest rate; therefore, care should be taken in determining an appropriate interest rate to be used by the model.)

Amortization Period

Generally, the amortization period input by the user will be equal to the contract term (it should never be greater than the contract term). The amortization period is used to calculate the annual debt service (i.e., principal plus interest) that is used in P/PV annual cost calculations.

Discount Rate

This is not a user input. The assumed discount rate of 10 percent was discussed earlier. All future-period cash flows are discounted at the rate of 10 percent to determine NPVs.

Rooms-to-Restaurant-Seats Ratio, Food Sales

If a restaurant is desired, use the input values in Appendix I as a guide.

Coin-Operated Laundry Revenue

This is a per-occupied room, per-night, average figure to be input by the user if the contractor is to have coin-operated laundry facilities. However, the input value is initialized to zero, since Navy BQs usually have free laundry facilities.

Other Vending Revenue

The MILCON option shows no other vending (e.g., soft drink machines) revenue. However, the model assumes that the contractor would be allowed to install, and keep the revenues from, other vending equipment.

Rooms Expense: Linen

For a MILCON BOQ, this would be the amount charged per room-night for providing daily maid service. This is necessary since the TDY officer claims this

charge on per diem which is reimbursed from appropriated travel funds. For a P/PV BEQ, it is not a user input; the model has an internal industry average value.

For a MILCON BEQ, this would be input here as the cost per occupied room per night. Alternatively, and more likely, this expense would be included in another line item such as the general "other" category, since most activities do not break this out separately as the private sector does. For a P/PV BEQ, the model has an internal value, and it is not a user input.

Rooms Expense: Operating Supplies

These are operating supplies such as soap, toilet paper, and other supplies necessary for running the BQ. For a MILCON BQ, these figures are usually planned and accounted for as a total annual cost for the facility. That cost must be divided by the number of planned rooms and then by 365 days to arrive at the MILCON cost factor for entry into the model. For a P/PV BQ, the model has an internal value, and it is not a user input.

Rooms Expense: Laundry and Dry Cleaning

Any laundry and dry cleaning services to be provided at no cost to the resident in a MILCON BQ facility should be input here. The estimated total annual cost for the facility must be divided by the number of planned rooms and then divided by 365 days, to arrive at the MILCON cost factor for entry into the model. For a P/PV BQ, the model has an internal value, and it is not a user input.

Rooms Expense: Other

All other normal room operating expenses for the planned MILCON BQ should be entered here. Also, if individual costs for any of the above three rooms expense categories cannot be split out from historical data for other BQs on base, then this line item should include those items as well. For a P/PV BQ, the model has an internal value, and it is not a user input.

(Note: The next four line items on the INPUTS spreadsheet are not user input for either MILCON or P/PV, and are used for internal P/PV BQ calculations only.)

Administrative and General

The MILCON BQ costs generally do not include a category for "administrative and general" expenses — those overhead expenses attributable to the BQ such as photocopying, legal, accounting, etc. Therefore, the base will not likely have any input numbers for the planned MILCON BQ for this line, since they are normally included, implicitly, as part of other expenses such as payroll and operating supplies. Therefore, this is not a user input for either a MILCON or a P/PV BQ. The model uses an internal value.

Management Fee

Private developers/contractors of hotels and dormitories make their profit in several ways. One place is the "management fee," which provides some profit over and above the actual operating costs of the facility. The range of typical management fees for these types of facilities is 3 to 5 percent of "gross revenues." For P/PV BQs, the model uses an assumed 4 percent that remains fixed (it is not a user input). Of course, there is no management fee for a MILCON BQ.

Property Operations and Maintenance

Estimated property operations and maintenance (O&M) on the MILCON BQ facility is input here. The average total annual estimate should be divided by the number of planned rooms to yield the annual O&M costs per available room for input. This MILCON cost is then used by the model for P/PV BQ O&M costs as well. If the base cannot separate out laundry maintenance expenses, then the model estimate of $7.57 per year per washer and dryer should be subtracted here (see Laundry Maintenance).

Number of Washers and Dryers

Free washers and dryers for use by occupants are assumed. In the P/PV column, the user should input the ratio of washers and dryers to the number of planned rooms (e.g., 1 washer and dryer per 20 rooms is typical, and would yield a .05 value to be input). No value is input for MILCON since washer and dryer O&M costs are not normally separated out from other property O&M costs as they are for the private sector.

Laundry Maintenance

The private sector normally estimates about $7.57 (1989 prices) per machine per year for maintenance expenses on guest-operated washers and dryers. Rooms, and not the number of washers, are used as the base since the number of rooms determines the number of users. Unless the base has information to the contrary, $7.57 should be input under MILCON. The model will use the same figure for the P/PV that is input for MILCON.

(Note: The figure input here should not be included in the general property operations and maintenance amount.)

Energy Expense

Since the P/PV would have to buy utilities from the base, the MILCON and P/PV facilities would have approximately the same energy costs. Additionally, rooms will be heated or cooled even if vacant in most cases. Therefore, the base should estimate the total annual energy bill for a new MILCON facility, divide the estimate by the number of available (i.e., constructed) rooms in the facility, and enter the result here.

Building, Contents, and Liability Insurance

The Navy does not purchase insurance on its facilities. The OMB Lease Versus Buy Analysis (A-104) Guidelines prescribe a formula to estimate the Government's cost of self-insurance. This formula is internal to the model and is not a user input.

Ground Rent

There is no ground rent cost to the Navy for a MILCON BQ. The model assumes a nominal ground rent of $100 per month charged by the Navy to the contractor for an on-base P/PV BQ. Therefore, this is not a user input.

Design Cost, Contingency Cost

This is not a user input. For MILCON, the model uses the NAVFAC standard rate of 6 percent for design and 5 percent for contingency and appropriately adds these in during the model's roll-up of total facility costs. The roll-up in the model works the same as the DD Form 1391 MILCON estimating procedure. For a P/PV, the square-foot construction cost figure that the base obtains from Marshall is a

"total delivered cost." In other words, it has included within it all facility costs such as design, contingency, etc.

Supervision, Inspection, and Overhead

This is not a user input. The model uses the NAVFAC standard rate of 5.5 percent for MILCON. The model also has an industry standard that it uses for the P/PV.

Tangible Personal Property

The base should determine the per-room cost of tangible personal property (e.g., bed, desk, chair, lamp, clock, TV, etc.) for each applicable room type for a new MILCON BOQ. This per-room estimate for MILCON is input here. The model has an internal value for the P/PV BQ, and it is not a user input.

Loan Amount, Interest Rate, and Amortization Period

These factors relate to the P/PV BQ option. All of these input variables depend on whether a guaranteed quarterly occupancy rate will be offered to the contractor. If no guarantee is offered, or if the guarantee is below 65 percent, the model will automatically enter a loan amount of 75 percent, corresponding to conventional mortgage financing. Going along with no guarantee, the model will allow an input for the mortgage interest rate between 11 and 18 percent. The base should check the going rate for 30-year fixed-rate home mortgages in the local area and add 1 percent.

If an occupancy guarantee is offered, the model will automatically enter a loan amount of 100 percent, corresponding to bond financing. Occupancy guarantees are a form of a revenue guarantee, and the guaranteed future stream of revenues can be sold for a price, the price being the bond interest rate. The model will allow an input for the bond rate between 7 and 11 percent. The base should check the going rate for 20-year A-rated bonds as the appropriate input value.

The amortization period can be no longer than 20 years if occupancy guarantees are offered since this is the maximum term for such leases allowed under current Federal law (Title 10 U.S.C., Section 2809). If no guarantees are offered, then longer leases are allowed and, therefore, longer amortization periods can be used for the conventional mortgage. The model can accommodate up to 40 years for an amortization period. The base should keep the amortization period as equal to or less

than the planned lease term, since a bond or mortgage company would not make a loan for a facility that exceeds the lease term.

Maintenance Annual Increase, Real Estate Tax Annual Increase, Building Annual Depreciation, and Land Annual Appreciation

These are not user inputs. All of these variables are set in accordance with the OMB A-104, *Analysis of Lease Versus Buy Alternatives*, regulations.

Gross Square Feet Per Room/Module

These figures must be calculated by the base for input into the model. The user should follow NAVFAC guidelines (i.e., NAVFAC DM-36.3, *Unaccompanied Officer Quarters*, for officers and DM-36.2, *Unaccompanied Enlisted Personnel Housing*, for enlisted), not forgetting to add space for mechanical equipment. For example, for the two test BOQs, we added 5 square feet to the gross square feet per room size for mechanical. For the test BEQ, we also added 5 square feet per module.

It is important that the number of rooms/modules times the gross square feet per room/module equal the total gross building square footage entered as input item number 13.

For a P/PV BOQ, the model uses the transient officer gross square feet per room when calculating the extra facility size needed to accommodate other authorized users (see below).

The user must understand the meaning of "a room" and "a module." For BOQs, there is only one person per room and one room per bathroom and, therefore, a room is the same as a module in a BOQ. However, the model assumes a different configuration for a BEQ. For the purposes of the model, a BEQ module consists of two rooms separated by a shared bathroom. Depending on enlisted rank, a module may be inhabited by one person (E7 and above), two persons (E5 and E6), or three or four persons (E1 – E4). This configuration is preferred by the Naval Military Personnel Command (''MPC) because of its flexibility and its favorable acceptance by personnel. The model user must be careful to input correct gross square footages for rooms for a BOQ, and for modules for a BEQ, in order for the analysis to be correct.

Payroll (Salaries)

These are not user inputs. BOQ military and civilian salaries of personnel assigned partially or totally to the facility were estimated for model purposes using the two test BOQ sites. Staffing for both was very similar, and NMPC agreed that they were representative. Fringe benefits have also been added to these salary figures. The model automatically scales MILCON BOQ salaries up and down according to the number of planned rooms.

The P/PV BOQ salary cost functions were estimated by PKF from nationwide industry data. These cost functions take account of economies of scale of larger BOQs and are deemed accurate for BOQs with 50 to 500 rooms.

The figures for appropriate MILCON BEQ staffing and salaries were determined in consultation with NMPC guidelines. Appropriate P/PV BEQ staffing and salaries were developed from pro forma income statements provided to LMI by several leading dormitory developers in the industry. The model automatically scales the staffing and salaries of MILCON and P/PV BEQs up and down, depending on the number of planned modules.

If a restaurant is included in a P/PV option, the user must separately enter the estimated salary figures. As mentioned previously, a small restaurant in a Navy BQ is not likely to be profitable and, therefore, not desired by the industry. However, should the user wish to analyze this option, recommended input values for all restaurant input variables can be found in Appendix I.

Other Authorized Users

These variables only have relevance to P/PV BOQs. Other authorized users — which means anyone other than active duty military who are currently authorized to stay in a BOQ at the particular base under analysis — represent a potential extra revenue source to the contractor. Active duty officers can be ordered to stay in the BOQ, even a P/PV BOQ, if it is suitable according to Navy guidelines. These active duty officers form the crux of the activity s requirement for a new P/PV BOQ, just as they are the requirement for a new MILCON BOQ. Therefore, they are the primary market for the contractor.

Unlike a normal private hotel, the BOQ will restrict the contractor's client market. Beyond the active duty officers who must stay in the BOQ, other authorized

users (OAUs) can be a major factor in the contractor's market. OAUs cannot be forced to stay in the BOQ; however, a contractor would like to attract them through marketing efforts (they are to be charged the same price as active duty officers, according to NMPC). If there are sufficient numbers of OAUs regularly at the base or in the local geographic area, the contractor may even want to construct additional rooms in the facility to accommodate them. Most of them are probably staying at off-base hotels at significantly higher room rates and might prefer the convenience and price of a new P/PV BOQ. This should normally be viewed as a benefit to the base since their revenue to the contractor can help cover debt service and other operations costs, possibly leading to lower room rates for all persons in the BOQ.

The economic results produced by the model for a BOQ are highly sensitive to the number of OAUs entered by the user. The base should consult historical records to determine a reliable estimate of the "OAU annual nights." This is not the number of other authorized users annually, but the number multiplied by the average length of time in the local geographic area.

The percentage of potential guests per day is an estimate of the proportion of OAUs who would voluntarily stay in the new P/PV BOQ. We recommend using the conservative estimate of .05 (5 percent) as an input value.

The model multiplies the above percent by the estimated annual number of OAU nights, divides the result by 365 days per year, and thus arrives at the number of rooms that could consistently be filled by OAUs. The model assumes that the contractor would construct that many additional rooms beyond the requirement specified for the MILCON BOQ. The contractor would build them to the specifications for transient officers, furnish them as transient officer rooms, and keep them rented to OAUs at the contract room rate. (Transient officers can also occupy these extra rooms if the demand is there at any given time.)

APPENDIX I

INPUTS FOR A BACHELOR OFFICERS QUARTERS RESTAURANT OPTION

INPUTS FOR A BACHELOR OFFICERS QUARTERS
RESTAURANT OPTION

BACKGROUND

Discussions with representatives from the hotel industry and our own analysis revealed that a small restaurant in a Navy Bachelor Officers Quarters (BOQ) would generally not be economically feasible, given the limited market. A contractor would therefore not want to include a restaurant and, if asked to include it, would have to increase room rates to compensate for restaurant losses. However, should a base want to consider requiring a restaurant in the BOQ, this appendix provides guidance on the recommended input values necessary to include this feature in the BAS Model. The resulting model output, when compared with the same BOQ facility without a restaurant, will show the effect of including a restaurant on life-cycle costs and BOQ room rates.

These recommended input values are based upon hard data from the industry. The base should not deviate from them, especially the assumed average dollars spent in the restaurant per occupant. Deviation from these recommended inputs may give unrealistic economic results.

RECOMMENDED INPUT VALUES

The Rooms-to-Restaurant-Seats Ratio (see Other Input Information, number 5, Appendix F) should be set at three (3). Industry standard square footages, as well as equipment and operations and maintenance costs, are internal to the model and are driven by this ratio.

Food Sales should be set at $5.40 (1989 prices). This is the assumed average amount that each occupant would spend in the restaurant per day (primarily breakfast). It is not a per-meal figure, but rather an average expenditure per day per occupant.

Percent beverage to food should be set at .20. If a lounge is allowed, set this ratio at .33.

APPENDIX J

BACHELOR QUARTERS ANALYSIS SYSTEM:
YEARLY UPDATE MACRO

BACHELOR QUARTERS ANALYSIS SYSTEM: YEARLY UPDATE MACRO

INTRODUCTION

This appendix describes the invocation, command structure, and functions provided by the Bachelor Quarters Analysis System (BAS) Yearly Update Macro (herein referred to as ALT Y). The purpose of ALT Y is to make yearly changes to both INPUTS and Bachelor Quarters (BQ) in order to keep the spreadsheets up to date. Thus, the macro is invoked in a similar manner for both spreadsheets. However, ALT Y supports different functions for INPUTS and BQ as documented in this appendix.

INVOCATION

Execute ALT Y in the same manner for both the INPUTS and BQ spreadsheets. There are two steps that are performed after INPUTS or BQ has been loaded. The first is to break out of the INPUTS or BQ macros by pressing ALT + Y. The steps are shown in Table J-1.

TABLE J-1

INVOKING ALT Y

Command	Explanation/comment
[CTRL] + [BREAK]	*Press the CTRL key and tap the BREAK key to break out of the INPUTS or BQ macros*
[ESC]	*Press the ESC key to gain control of the keyboard*
[ALT] + Y	*Press the ALT key and tap the letter "Y" to actually invoke the yearly update macros*

COMMAND STRUCTURE

The command structures for ALT Y in INPUTS and BQ are provided in Figure J-1. Briefly, ALT Y in INPUTS provides first-level functions such as Inflation, Year, Wages, Benefits, Save, and Menu. ALT Y in BQ supports functions

such as Year, Save, and Menu. The reader is directed to the next section for a complete list of the functions supported by ALT Y in both INPUTS and BQ.
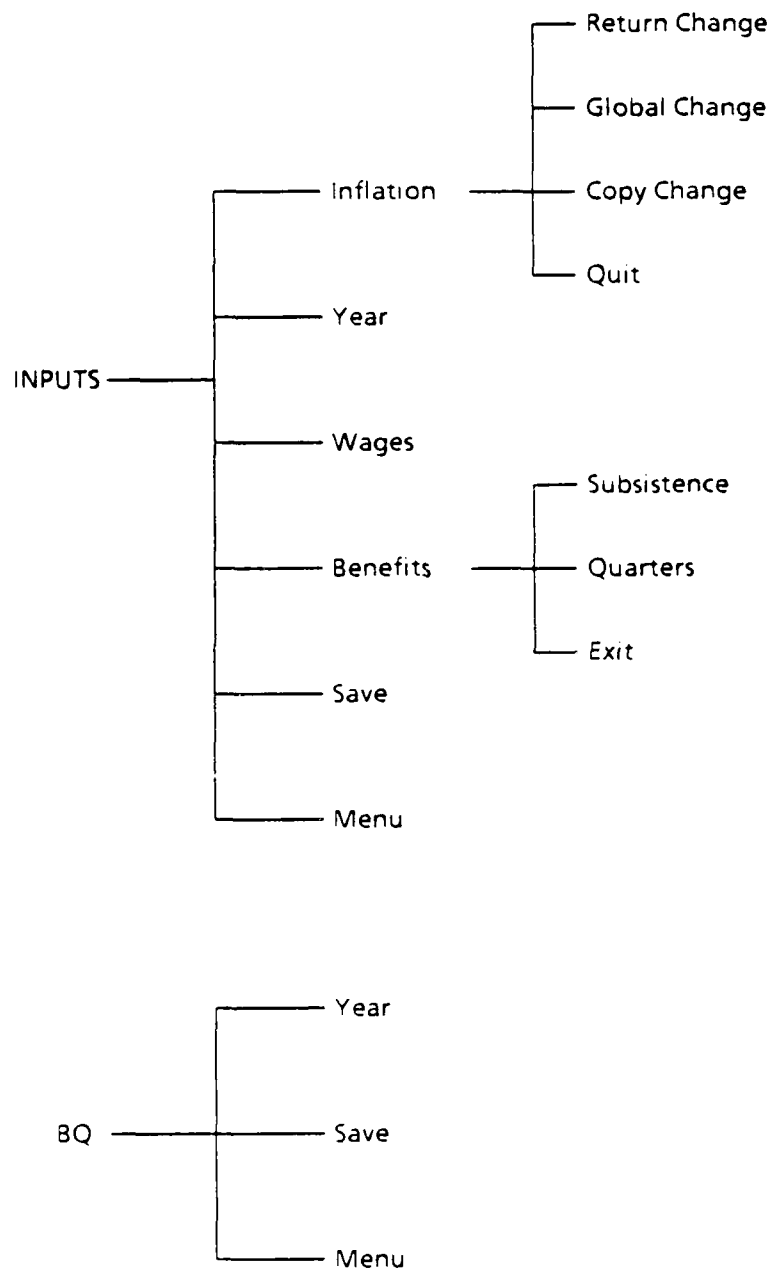

FIG. J-1. ALT Y COMMAND STRUCTURE

FUNCTIONS

Table J-2 lists and describes each of the ALT Y functions in the INPUTS and BQ spreadsheets. Each function in the table is identified by its spreadsheet/menu path. For instance, Return Change (see Figure J-1) is referred to as INPUTS/ALT Y/INFLATION/RETURN CHANGE, which states that RETURN CHANGE is found in the ALT Y macro under the first-level function called "INFLATION." Finally, the functions are listed in order according to the command structure chart in Figures J-2, J-3, and J-4.

TABLE J-2

ALT Y FUNCTIONS

Function	Description
INPUTS/ALT Y/INFLATION/ RETURN CHANGE	Change INPUTS Inflation Indices until pressing RETURN
INPUTS/ALT Y/INFLATION/ GLOBAL CHANGE	Change Inflation Indices until the bottom of the list
INPUTS/ALT Y/INFLATION/ COPY CHANGE	Select an Inflation Index and copy it to the bottom of the list
INPUTS/ALT Y/YEAR	Enter the current or model year in INPUTS
INPUTS/ALT Y/WAGES	Change Military Salaries by Rank until the bottom of the list
INPUTS/ALT Y/BENEFITS/ SUBSISTENCE	Change Basic Allowance for Subsistence for Officers and Enlisted
INPUTS/ALT Y/BENEFITS/QUARTERS	Change Basic Allowance for Quarters by Rank until bottom of the list
INPUTS/ALT Y/SAVE	Save an updated version of INPUTSyy
INPUTS/ALT Y/MENU	Exit INPUTS ALT Y and access INPUTS Main Menu
BQ/ALT Y/YEAR	Change the current or model year of BQ
BQ/ALT Y/SAVE	Save an updated version of BQyy
BQ/ALT Y/MENU	Exit BQ ALT Y and access BQ Main Menu

```
DJ789:  PR [W15]  + $LMI – LOGO                              MENU

Inflation    Year      Wages      Benefits    Save      Menu
Enter/View Inflation Indices

              DJ        DK        DL        DM        DN        DO        DP

789   LMI BQ-Analysis System                22-Feb                    Version:
790   INPUTS89.WK1          INPUTS YEARLY MAINTENANCE MENU                4.0
791
792
793            Instructions for the INPUTS Yearly Maintenance Functions
794
795       Use the right or left arrow keys and highlight the selection you wish
796       to execute.  Then press [ENTER].
797
798   CHANGE INPUTS
799      COMMAND                              EXPLANATION
800   -----------------------------------------------------------------------
801     INFLATION          Enter/view inflation indices.
802       YEAR             Enter the current year of the model (used for INPUTSyy).
803      WAGES             Enter/view military salaries and staffing levels.
804     BENEFITS           Enter/view allowances for subsistence & quarters.
805       SAVE             Save INPUTSyy.
806       MENU             Exit Yearly Maintenance and access INPUTS Main Menu.
807
808

02-Mar-90    03:04 PM                        CMD
```

FIG. J-2. INPUTS YEARLY MAINTENANCE MENU

```
EW1:  PR  + $LMI – LOGO                                          MENU

Return Change       Global Change       Copy Change       Quit

 Make changes to Inflation Indices until [RETURN] is pressed

          EW        EX        EY        EZ        FA        FB        FC

  1    LMI BQ-Analysis System              22-Feb                   Version:
  2    INPUTS89.WK1                   INFLATION TABLE                   4.0
  3
  4    CURRENT    BASE      INITIAL              INFLATION        INFL    CUM
  5    YEAR       YEAR      PERIOD      YEAR     INDICES (%)     FACTORS  INFL
  6
  7                           0         1986     PSC BASE            1    1.125
  8                           1         1987      4.0%           1.040
  9                           2         1988      4.0%           1.082
 10 ——————>                   3         1989      4.0%           1.125
 11                           4         1990      3.6%           1.165
 12            ——————>        5         1991      3.3%           1.204
 13                           6         1992      2.8%           1.238
 14                           7         1993      2.3%           1.266
 15                           8         1994      2.3%           1.295
 16                           9         1995      2.3%           1.325
 17                          10         1996      2.3%           1.355
 18                          11         1997      2.3%           1.387
 19                          12         1998      2.3%           1.418
 20                          13         1999      2.3%           1.451

 02-Mar-90   03:06 PM                    CMD
```

Note: PSC – private sector cost.

FIG. J-3. INFLATION TABLE

```
BF777:  PR [W15]  + $LMI – LOGO                              MENU

Year     Save      Menu

Enter the year for the file name postfix

              BF            BG          BH          BI          BJ

777   LMI BQ-Analysis System              Feb-90              Version:
778   BQ89.WK1                 BQ YEARLY UPDATE MENU              4.0
779
780
781                      Yearly Update Instructions
782
783      Use the right or left arrow keys and highlight the selection you wish
784      to execute.  Then press [ENTER].
785
786
787   COMMAND                 EXPLANATION
788   -----------------------------------------------------------------------
789    YEAR            Enter the year of the model (BQyy).
790    SAVE            Save a copy of BQyy.
791    MENU            Execute the Main Menu options.
792
793
794
795
796

02-Mar-90   03:15 PM                     CMD
```

FIG. J-4. BQ YEARLY UPDATE MENU

APPENDIX D

DECISION GUIDE FOR EVALUATING THE FEASIBILITY OF PUBLIC/PRIVATE VENTURES FOR NAVY BACHELOR QUARTERS

PREFACE

Appendix D was originally published by LMI as a decision guide with a restricted distribution. We have reprinted it here with no changes. Thus, material in the original document or appended to it bears the same numbering and designation it did when previously published.

DECISION GUIDE FOR EVALUATING THE FEASIBILITY OF PUBLIC/PRIVATE VENTURES FOR NAVY BACHELOR QUARTERS

Introduction

The Navy has a substantial requirement for new bachelor housing facilities to meet the needs for new missions, to replace many aging and substandard structures, and to lower the costs of housing transient personnel off-station at commercial rates. In the current economic climate, it is unlikely that all of these requirements can be satisfied by traditional military construction (MILCON) funding. Further, Congress has directed the Navy to explore the possibilities of providing bachelor quarters by alternative mechanisms, such as private sector financing, construction, operation, and maintenance. Title 10, United States Code, Section 2667, and a recent legislative initiative, Title 10, United States Code, Section 2809, provide several opportunities for these public/private ventures.

This decision guide has been developed by Naval Facilities Engineering Command with the assistance of the Logistics Management Institute, to assist activities and claimants having bachelor quarters requirements in a preliminary assessment of their potential project. This version of the guide addresses Bachelor Officers Quarters for transients. Subsequent versions will expand this to other categories of bachelor housing. The guides will indicate whether or not a public/private venture project might be feasible for a given set of parameters specified by the user, and will assist in highlighting factors which could improve the feasibility or desirability of the resulting project through use of specific public/private venture opportunities.

The market and economic analyses necessary to support the final decision to proceed with a public/private venture alternative are expensive and time-consuming. In addition, many operational and physical constraints m~y affect the suitability of these alternatives for an activity's particular situation. The use of this guide should enable the activity and its chain-of-command to make a decision, based on their detailed facility requirements and various factors affecting a potential

project, as to whether or not they are interested in pursuing this means toward a project.

Any questions on public/private ventures, or on the use of this guidance should be directed to:

> Director, Facilities Development Division
> Naval Facilities Engineering Command
> 200 Stovall Street
> Alexandria, VA 22332-2300
> A/V 221-7342   COM (703) 325-7342

Guide Structure and Assumptions

The decision guide, comparative matrix, and economic models developed to date are based on several specific assumptions about the project to be developed. These include:

- Valid stable requirement, primarily transient.

- Use of one standard room size (250 SF).

- No restaurant or lounge facilities included.

- Industry (hotel) standard design and construction to local building codes.

- Private contractor ownership, construction, operation, maintenance, and repair.

- Initial room rate increases allowed in a predetermined relationship to Consumer Price Index (CPI).

The guide is organized into three sections, based on an increasing level of specific information about the potential project.

Section 1 essentially explores those conditions which would make such a project infeasible.

Section 2 interprets influencing factors to determine the most suitable type of arrangements and conditions for all parties.

Section 3 examines the sensitivity of these factors and provides an approximate quantification of the project.

SECTION 1

IN EACH OF THE FOLLOWING QUESTIONS, YOUR ANSWER INDICATES YOUR ACTIVITY'S REQUIREMENTS OR PREFERENCES REGARDING DEVELOPMENT OF A PUBLIC/PRIVATE VENTURE BOQ. IN THIS FIRST SECTION, "C" ANSWERS INDICATE THAT A P/PV WOULD NOT BE FEASIBLE TO A DEVELOPER OR COMPATIBLE WITH YOUR STATION'S SITUATION. THESE FACTORS SHOULD THEREFORE BE ASSESSED OR MODIFIED IF POSSIBLE TOWARD THE "A" OR "B" RESPONSES, IN ORDER TO CONTINUE TO CONSIDER A P/PV.

1. Is the BOQ requirement:
    a. primarily for TDY personnel?
    b. for a mixture of permanent party and TDY personnel?
    c. exclusively for permanent party personnel?

2. After looking at the existing off-base conditions, is there:
    a. no available accommodations for bachelor officers?
    b. some space available, at a cost which exceeds per diem, or which provides more desirable alternative living conditions to bachelor officers?
    c. plenty of economical and desirable accommodations?

3. When setting contract terms for land out-lease for a BOQ, or for an agreement covering the provision of BOQ services, can you forecast your activity's needs, and therefore be willing to contract:
    a. indefinitely?
    b. for at least 20 years?
    c. for only short terms or cannot forecast?

4. When considering management policy for a BOQ, considering activity operational requirements, would you:
    a. let a contractor operate a BOQ essentially the same as a good civilian hotel?
    b. want some control over daily operation of the BOQ?
    c. want total control over operations, as with an existing government-owned facility?

IF YOU HAVE ANSWERED "C" TO ANY OF THESE QUESTIONS, A P/PV BOQ IS PROBABLY NOT SUITABLE FOR YOUR ACTIVITY. IF THERE ARE NO "C" ANSWERS, OR IF RESPONSES CAN BE ALTERED TO "A" OR "B" CONDITIONS, PROCEED TO THE NEXT SECTION, TO DETERMINE THE TYPE OF P/PV ARRANGEMENT WHICH WOULD BE MOST SUITABLE TO YOUR ACTIVITY.

SECTION 2

THE FOLLOWING QUESTIONS ADDRESS AREAS OF CONSIDERATION WHICH WOULD AFFECT THE TYPE OF P/PV ARRANGEMENT WHICH WOULD BE MOST SUITABLE FOR YOUR ACTIVITY, OR FACTORS WHICH COULD IMPROVE THE ECONOMIC AND OPERATING CONDITIONS OF THE P/PV. "A" ANSWERS INDICATE THE HIGHEST PROBABILITY OF SUCCESS FOR A P/PV, USING THE ASSUMED CONCEPTS. "B" ANSWERS, WHILE STILL INDICATING A FAIR CHANCE OF SUCCESS, SHOULD BE VIEWED AS INDICATIONS OF A PROJECT POTENTIALLY MORE DIFFICULT TO IMPLEMENT. "C" ANSWERS TO THESE QUESTIONS REVEAL AREAS WHERE PROBLEMS IN STRUCTURING OR IMPLEMENTING THE P/PV ARRANGEMENT MIGHT BE ANTICIPATED. IF A MAJORITY OF ANSWERS ARE IN THE "B" OR "C" RANGE, RESPONSES SHOULD BE CONSIDERED IN VIEW OF THE "SENSITIVITY CHARTS" SECTION OF THIS GUIDE.

5. Is the size of your existing overall BOQ deficit:
   a. large (over 300 rooms)?
   b. medium (100 – 300 rooms)?
   c. small (less than 100 rooms)?

6. Does your activity:
   a. have other existing substandard or inadequate BOQ's?
   b. have no existing BOQ's?
   c. have existing adequate BOQ facilities?

7. Considering BOQ requirements by month, do they:
   a. remain fairly steady?
   b. fluctuate, in accord with predictable factors such as training cycles, scheduled operations, etc.?
   c. vary widely and unpredictably?

8. Considering other potential users (in accordance with current NMPC policy) of a BOQ facility at your activity, would you:
   a. be willing to allow the contractor to encourage patronage by retired military, military on leave, parents or families or officers, or DoD civilian contract personnel?
   b. allow limited access to some of these categories?
   c. restrict access to only active duty assigned personnel?

9. Considering assignment policies and priorities, would you:
   a. allow P/PV BOQ rooms to be filled before assigning personnel to existing facilities?
   b. have no preference for which facility personnel were assigned to first?
   c. require existing BOQ's to be filled first?

10. Would you:
    a. be willing to guarantee a high level of occupancy (80 – 90%) to the developer, and pay for unused rooms out of base funds if that guaranteed level is not met?
    b. be willing to guarantee a moderate level of occupancy (50 – 80%)
    c. be unwilling to guarantee any level of occupancy?

11. Concerning your policies on facilities maintenance, would you:
    a. be willing to agree to standards and safeguards, based on commercial codes and standards, and to rely on contract procedures to insure compliance?
    b. require, in addition to the above, frequent government inspections and audits?
    c. want total government control of maintenance standards, schedules, etc.?

12. Considering other services and amenities which might be associated with a BOQ function (such as a restaurant or breakfast bar, exercise room, etc.), would you:
    a. allow such services if they contribute to the project's desirability or viability?
    b. minimize the opportunities for such services?
    c. prohibit any services other than provision of rooms?

13. Is your activity located:
    a. in an urban area, with high potential for other users?
    b. close to an urban area, with some potential for additional users?
    c. in an isolated location, with little potential for other users?

14. Would you be willing to site a P/PV BOQ on station land:
    a. with no additional fencing or control?
    b. if it could be "fenced out," or access controlled?
    c. under no circumstances?

15. If you are willing to site a P/PV BOQ on station land, is the on-base site for the proposed project:
    a. near the station perimeter, on land that could be severed if necessary?
    b. on land that could be severed with some difficulty or expense (such as other facility relocations)?
    c. on land that would be impossible to sever?

16. Is the on-base site:
    a. reasonably "developable," with no anticipated environmental or planning problems?
    b. fairly "developable," as evidenced by experience on similar nearby sites?
    c. constrained by environmental or planning factors, such as AICUZ, etc.?

17. Would an off-base site be acceptable:
    a. if necessary, without anticipated environmental, operational, or political problems?
    b. with careful coordination with the local community, and existing station operations?
    c. under no circumstances?

This step in the P/PV decision process is far more quantitative and will allow sensitivity comparisons based on your inputs. If, after referring to sections 1 and 2, you believe that a P/PV BOQ at your location is feasible, it is time to use the tables in this section to determine whether or not to initiate the economic analyses necessary to support the final decision. You will need information and decisions on the following criteria:

- On-base or off-base siting.

- Size of transient officer requirement expressed in number of rooms.

- Size of permanent party officer requirement expressed in number of rooms.

- Expected number of other authorized users per week. These are defined as officer retirees, officers on leave, Government contractors, and other non-duty personnel to whom you would grant BOQ privileges.

- The percent of average quarterly occupancy you are willing to guarantee, realizing that shortfalls will be paid from local funds.

There are two other criteria which have not been included in the decision tables but which should be kept in mind during this analysis. The first is mortgage interest rates. Since the Government does not have to borrow funds in the mortgage market to construct a BOQ, a private developer is placed at an increasing disadvantage as mortgage rates start to rise. The feasibility of a P/PV BOQ, compared with a MILCON BOQ, therefore diminishes during periods of high mortgage rates. The second criterion to keep in mind is the length of the contract term. Industry interest decreases rapidly for contract terms of less than twenty years because of the large capital investment that needs to be amortized. Even if industry can be pursuaded to bid on a ten-year contract, the room rates needed to amortize the investment would exceed what the Government is paying in per diem.

With these things in mind you should refer to the decision tables in this section. There are two tables, one for an on-base siting and one for an off-base siting. First choose the table that matches your siting decision. Then, starting from the left, choose the range in each column which matches the information you have gathered or the decisions you have made. As you work your way towards the right, you will be

led to a "-", "0", or "+" sign in one of the right-hand columns. These signs represent the following conclusions:

— The parameters you have chosen do not lend themselves to a successful P/PV BOQ. It would either not attract industry interest or would cost the Government more than a conventionally built and operated MILCON facility.

0 The parameters you have chosen make the feasibility of a P/PV BOQ too close to call using the generalized comparisons of this decision guide. The cost to the Government of a P/PV BOQ and a MILCON BOQ are almost identical. A full analysis is needed before a recommendation can be made.

+ The parameters you have chosen are likely to lead to a successful P/PV BOQ. A full analysis is needed to confirm this recommendation and to examine the final parameters to be included in the request for proposals.

The "full analysis" referred to above means using a computerized BQ analysis system (BAS) model maintained by your Engineering Field Division. The inputs are extensive and definitive and address such site-specific factors as cost of special construction features on the on-base site, the cost of comparable land off base, and the energy costs for your location. The model uses the analysis methods directed by the Office of Management and Budget to compare the P/PV BOQ with an equivalent MILCON facility. This comparison must be presented to the Congress for approval before a contract may be awarded.

By trying different combinations of inputs in the decision tables, you can test the "sensitivity" of each of your decisions and criteria. If the results from using the three sections in this preliminary guide lead you to a full BAS analysis, contact your Engineering Field Division for information on how to initiate it.

TABLE 1

ON-BASE BOQ OPTIONS

Transient size requirement	Permanent party size requirement	Number of other authorized users/week	Occupancy guarantee percentage			
			0	70 – 90	81 – 90	90 – 100
25 – 100	0	0 – 140	0	+	+	+
25 – 100	0	141 – 700	0	+	+	+
25 – 100	0	701 – 1,400	0	+	+	+
25 – 100	25 – 100	0 – 140	0	0	0	0
25 – 100	25 – 100	141 – 700	0	+	+	+
25 – 100	25 – 100	701 – 1,400	+	+	+	+
25 – 100	101 – 300	0 – 140	–	–	–	–
25 – 100	101 – 300	141 – 700	–	–	–	–
25 – 100	101 – 300	701 – 1,400	–	–	–	–
25 – 100	301 – 500	0 – 140	–	–	–	–
25 – 100	301 – 500	141 – 700	–	–	–	–
25 – 100	301 – 500	701 – 1,400	–	–	–	–
101 – 300	0	0 – 140	0	0	0	0
101 – 300	0	141 – 700	0	0	0	0
101 – 300	0	701 – 1,400	0	+	+	+
101 – 300	25 – 100	0 – 140	–	–	–	–
101 – 300	25 – 100	141 – 700	–	–	–	–
101 – 300	25 – 100	701 – 1,400	–	–	–	–
101 – 300	101 – 300	0 – 140	–	–	–	–
101 – 300	101 – 300	141 – 700	–	–	–	–
101 – 300	101 – 300	701 – 1,400	–	–	–	–
101 – 300	301 – 500	0 – 140	–	–	–	–
101 – 300	301 – 500	141 – 700	–	–	–	–
101 – 300	301 – 500	701 – 1,400	–	–	–	–
301 – 500	0	0 – 140	0	0	0	0
301 – 500	0	141 – 700	0	0	0	0
301 – 500	0	701 – 1,400	0	0	0	0
301 – 500	25 – 100	0 – 140	–	–	–	–
301 – 500	25 – 100	141 – 700	–	–	–	–
301 – 500	25 – 100	701 – 1,400	–	–	–	–
301 – 500	101 – 300	0 – 140	–	–	–	–
301 – 500	101 – 300	141 – 700	–	–	–	–
301 – 500	101 – 300	701 – 1,400	–	–	–	–
301 – 500	301 – 500	0 – 140	–	–	–	–
301 – 500	301 – 500	141 – 700	–	–	–	–
301 – 500	301 – 500	701 – 1,400	–	–	–	–

TABLE 2

OFF-BASE BOQ OPTIONS

Transient size requirement	Permanent party size requirement	Number of other authorized users/week	Occupancy guarantee percentage			
			0	70 – 90	81 – 90	90 – 100
25 – 100	0	0 – 140	0	+	+	+
25 – 100	0	141 – 700	0	+	+	+
25 – 100	0	701 – 1,400	0	+	+	+
25 – 100	25 – 100	0 – 140	0	0	0	0
25 – 100	25 – 100	141 – 700	0	0	0	0
25 – 100	25 – 100	701 – 1,400	0	+	+	+
25 – 100	101 – 300	0 – 140	–	–	–	–
25 – 100	101 – 300	141 – 700	–	–	–	–
25 – 100	101 – 300	701 – 1,400	–	–	–	–
25 – 100	301 – 500	0 – 140	–	–	–	–
25 – 100	301 – 500	141 – 700	–	–	–	–
25 – 100	301 – 500	701 – 1,400	–	–	–	–
101 – 300	0	0 – 140	0	0	0	0
101 – 300	0	141 – 700	0	0	0	0
101 – 300	0	701 – 1,400	0	+	+	+
101 – 300	25 – 100	0 – 140	–	–	–	–
101 – 300	25 – 100	141 – 700	–	–	–	–
101 – 300	25 – 100	701 – 1,400	–	–	–	–
101 – 300	101 – 300	0 – 140	–	–	–	–
101 – 300	101 – 300	141 – 700	–	–	–	–
101 – 300	101 – 300	701 – 1,400	–	–	–	–
101 – 300	301 – 500	0 – 140	–	–	–	–
101 – 300	301 – 500	141 – 700	–	–	–	–
101 – 300	301 – 500	701 – 1,400	–	–	–	–
301 – 500	0	0 – 140	–	–	–	–
301 – 500	0	141 – 700	–	–	–	–
301 – 500	0	701 – 1,400	–	–	–	–
301 – 500	25 – 100	0 – 140	–	–	–	–
301 – 500	25 – 100	141 – 700	–	–	–	–
301 – 500	25 – 100	701 – 1,400	–	–	–	–
301 – 500	101 – 300	0 – 140	–	–	–	–
301 – 500	101 – 300	141 – 700	–	–	–	–
301 – 500	101 – 300	701 – 1,400	–	–	–	–
301 – 500	301 – 500	0 – 140	–	–	–	–
301 – 500	301 – 500	141 – 700	–	–	–	–
301 – 500	301 – 500	701 – 1,400	–	–	–	–

APPENDIX E

**AN ECONOMIC ANALYSIS OF ALTERNATIVES
FOR PROVIDING BACHELOR OFFICERS' QUARTERS**

PREFACE

Appendix E was originally published as a separate report with a restricted distribution. We have reprinted it here with no changes. Thus, material in the original document or appended to it bears the same numbering and designation it did when previously published.

SECTION 2809 PUBLIC-PRIVATE VENTURE BACHELOR OFFICERS' QUARTERS NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT, AND NAVAL EDUCATION AND TRAINING CENTER, NEWPORT, RHODE ISLAND

AN ECONOMIC ANALYSIS OF ALTERNATIVES FOR PROVIDING BACHELOR OFFICERS' QUARTERS

January 1990

Prepared by Northern Division
Naval Facilities Engineering Command
Bldg. 77-1, U.S. Naval Base
Philadelphia, PA 19122-5094

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SECTION 2809 PUBLIC-PRIVATE VENTURE
BACHELOR OFFICERS' QUARTERS
NAVAL SUBMARINE BASE,
NEW LONDON, CONNECTICUT,
AND NAVAL EDUCATION AND TRAINING CENTER,
NEWPORT, RHODE ISLAND

AN ECONOMIC ANALYSIS OF ALTERNATIVES FOR PROVIDING BACHELOR OFFICERS' QUARTERS

BACKGROUND AND CONCLUSIONS

A large number of naval officers are assigned for temporary duty (up to 140 days) at the education and training activities at the Naval Submarine Base (NSB), New London, Connecticut, and at the Naval Education and Training Center (NETC), Newport, Rhode Island. To meet the Bachelor Officers' Quarters (BOQ) requirements at those two bases, additional transient BOQ units are needed. Currently the two bases are meeting their lodging requirements by issuing "nonavailability certificates" to transient officers; those certificates allow the officers to collect lodging per diem at rates of $50 in New London, and $80 in Newport. During FY87, New London issued nonavailability certificates totaling 26,352 room nights at a cost of $1,317,600 and Newport issued nonavailability certificates totaling 47,518 room nights at a cost of $3,801,440. In addition, there are 142 transient officer rooms at New London, all of which are of inadequate or substandard quality, based on DoD housing standards, because of their small size and lack of private baths. These quarters are programmed for renovation into permanent party quarters, of which there is also a shortage, regardless of either a new MILCON or PPV BOQ for transient officers. The conversion of these quarters will add to the number of nonavailability room nights at New London.

The U.S. Navy anticipates that the education and training activities at these installations will remain constant or possibly increase in the future. To reduce the BOQ requirement deficits, the Navy proposes a public-private venture (PPV) to allow a private developer to build a 150-unit BOQ on each installation, with the units to be provided by the developer/operator on a nightly basis to users as authorized by Section 2809, U.S. Code (USC) 10. The lodging costs of the Section 2809 BOQ units

must, however, be less costly than that in transient BOQ housing built as part of the Military Construction (MILCON) program, and less costly than the status quo. The economic analysis reported here was conducted to determine whether those lodging costs could be less than the costs of units built by MILCON and the costs of the status quo.

Continuation of the status quo will entail continued high levels of O&M travel expenditures for officers assigned temporary duty at New London or Newport. The net present value of the status quo alternative is $31.6 million for New London, and $50.6 million for Newport. The cost of the MILCON alternative is less than the cost of the Status Quo alternative. As a result of the economic analysis, the net present value of the MILCON alternative has been determined to be $27.4 million for New London, and $29.8 million for Newport. The cost to the Government of the PPV alternative, in turn, should cost less than the MILCON alternative. Based on bids received, the economic analysis determined that the cost to the Government of the PPV alternative will be $26.0 million for New London, and $24.8 million for Newport.

BOQ LODGING REQUIREMENTS

DoD regulations specify that new MILCON housing units may be built only when validated military housing deficits exist. Table 1 shows the existing deficits of unaccompanied transient officers units (i.e., transient BOQ) at both New London and Newport.

TABLE 1

UNACCOMPANIED TRANSIENT OFFICERS LODGING DEFICIT
AT NEW LONDON AND NEWPORT

Item	New London	Newport
Deficit (Pannell, Kerr, Forster, CPA)	239	209
Deficit (*Bachelor Housing Survey*)	245	355

ALTERNATIVE COURSES OF ACTION

The economic analysis reported here compares the following three lodging alternatives for New London and Newport:

- *Status Quo.* The first alternative is the continued issuance of nonavailability certificates to transient unaccompanied officers at the Government nightly lodging allowance rates.

- *Military Construction (MILCON).* This alternative consists of using appropriated MILCON funds to construct two 150-unit BOQ facilities, one on each installation. This alternative assumes MILCON funds will be appropriated as part of the FY90 MILCON program and the units will be delivered by the end of FY91. Operation, maintenance, and repair will be funded from annually appropriated O&M funds.

- *PPV Lodging.* Under this alternative, the Navy will enter into a long-term agreement, as authorized by Section 2809, USC(10), to allow a developer to design, construct, finance, own, operate, repair, and maintain two 150-unit BOQ facilities, one on each installation. (The next section presents a more detailed listing of the provisions of this particular alternative.)

PROVISIONS OF THE SECTION 2809 PPV PROJECT

The major provisions of the particular Section 2809 PPV BOQ project for New London and Newport are as follows:

- One request for proposals (RFP) will include both installations.

- The lodging cost of new PPV BOQ units must be less than both of the other alternatives.

- The BOQ facilities will be built on the installations.

- The developer/operator will be responsible for design, construction, financing, own...ship, operation, repair, and maintenance of the facilities for the period of the lease.

- The facilities will be built to local construction codes, except that Navy standards for fire, life safety, and health ·· ·l apply if they are more stringent. The units will meet Navy standards of adequacy (e.g , square footage) for transient officers.

- The facilities will be operated according to generally accepted industry standards for this type of lodging facility (i.e., budget hotel).

3

- The operator will receive lodging payments directly from transient officers staying in the units, and transient officers will be reimbursed through normal travel and per diem expense procedures.

- The installations will first refer transient officers on orders to the base to the PPV BOQ before any other Government or private quarters.

- The installations will agree to rent back a specified number of rooms, subject to credit for all actual room payments received.

- The leasing arrangement will not exceed 32 years.

- A validated deficit in military transient BOQ units exists on the installations.

METHODOLOGY AND ASSUMPTIONS

The status quo issuance of nonavailability certificates for transient officers to incur lodging costs on the local economy is the alternative to which other alternatives must be compared. Any change from the status quo must result in a cost saving to the Government. The economic analysis presented here is a comparison of the status quo, MILCON, and PPV Lodging Alternatives. In it, we express all future costs in then-year dollars and discount them to determine their present value. Thus, our results are comparisons of the net present value of the alternatives, which yield a net present value of the PPV Lodging Alternative that is less than the MILCON and status quo options.

Methodology

Prior to performance of this analysis, we determined which cost elements should be addressed (see Table 2). In the appendix, we explain how we developed cost element estimates. We performed calculations to estimate the present value of the stream of future expenditures required to implement each alternative (see Table 5).

We estimated the construction costs for the MILCON alternative from data submitted officially on DD Forms 1391 for BOQs and verified, corrected, and adjusted by the Logistics Management Institute (LMI). (Both MILCON project requests were deferred by the Congress.) The construction costs per square foot applied to the DD Forms 1391 data were the DoD pricing guidelines as specified in the 10 March 1988 memorandum, "Area Cost Factors and Unit Prices for FY 1990," issued by the Assistant Secretary of Defense for Production and Logistics.

TABLE 2

COST ELEMENTS

MILCON Alternative
- Construction costs
- Annual operation, and maintenance costs
- Imputed casualty and liability insurance costs
- Equipment replacement cost
- Imputed real estate taxes
- Terminal value of buildings
- Imputed land purchase
- Terminal value of land
- Government lodging allowances

PPV Lodging Alternative
- Nightly lodging payment
- Government contract management cost
- Government inspection cost
- Imputed land purchase
- Terminal value of land

Status Quo Alternative
- Government nightly lodging allowances

Operating and other recurring cost estimates came from information supplied by the bachelor housing offices at the two installations for existing military BOQs and from estimates made by LMI according to Navy economic analysis guidelines.

Assumptions

In the analysis, we make the following assumptions:

- The structural life for new construction is 50 years.

- New BOQ facilities are constructed on the installations under either the MILCON or PPV Lodging Alternatives. Under the Status Quo alternative, new BOQ facilities are not constructed at either installation during the entire analysis period.

- All currently authorized military BOQ users at these installations would be authorized to use the PPV BOQ's.

- A demand for the lodging facilities will exist beyond the analysis period (FY22).

In our calculations, we make the following assumptions:

- A discount rate of 9.4 percent is applied to determine the present value of current dollar expenditures.[1]

- Price level changes caused by inflation are included in this analysis. (DoD inflation rate guidelines are utilized on all applicable cost items.)

- Costs to the Government that do not reflect direct expenditures (i.e., "imputed" costs) are added to the cost of the MILCON alternative for real estate taxes.

- The analysis period is 33 years (FY90 through FY22). (This allows 1 year for construction of the PPV BOQ and 32 years of PPV operation, the maximum period allowed by Section 2809.)

- The MILCON alternative takes 2 years for contracting and construction and 31 years of operation to match the 33 years in the PPV lodging analysis period. To properly account for the costs attributable to the second year of contracting and construction for the MILCON alternative, we added status quo lodging per diem costs for 1 year.

- Actual occupancy rates in each year are assumed to be 90 percent.

- In the Status Quo alternative, nightly Government lodging allowances are increased over the analysis period at a rate that approximates inflation. The number of annual rentals to which status quo Government lodging allowances are applied is equal to the number of annual room nights available in a MILCON or PPV Lodging Alternative, times the 90 percent occupancy rate.

ANALYSIS RESULTS

The value of the cost elements used in this analysis and the "bottom line" results are shown in Table 3. The net present value of the Status Quo alternative shows the anticipated cost of relying on the local market for transient officer housing for 32 years. The value of the MILCON net present value is the total cost of the MILCON alternative. In order for the PPV BOQ lodging alternative to be considered

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[1] Discount rate derived in accordance with Office of Management and Budget procedures.

cost-effective, its net present value must be lower than that of the MILCON and Status Quo alternatives taking into account the Government's costs of contract management.

TABLE 3

ECONOMIC ANALYSIS RESULTS

	New London	Newport
Number of units	150	150
Starting date	FY90	FY90
Discount rate	9.4%	9.4%
Expected occupancy rate	90%	90%
Summary of Results		
Status quo NPV	$31.6M	$50.6M
PPV NPV	$26.0M	$24.8M
MILCON NPV	$27.4M	$29.8M
MILCON data		
Assumed annual operations and maintenance and insurance cost per unit	$7,065	$8,072
Imputed real estate tax rate	2.63%	2.63%
Status quo data		
Current lodging per diem	$50	$80

Our economic analysis shows that the net present value of the MILCON alternative has been determined to be $27.4 million for New London, and $27.6 million for Newport. The PPV BOQ units proposed by the Navy represent a significant saving over the status quo per diem costs. Based on bids received, the cost to the Government of the PPV alternative will be $26.0 million for New London and $24.8 million for Newport. These analyses establish the comparison of net present value alternatives that will insure that the Section 2809 PPV BOQ lodging facilities are the least costly alternatives at each installation. The advantages and disadvantages of each alternative are summarized in Table 4.

The worksheets in Table 5 show the expenditures and calculations which generate the net present value of each alternative.

TABLE 4

COMPARISON OF HOUSING ALTERNATIVES

Element	Alternatives		
	Status quo	MILCON	PPV
Net present value	Disadvantage	Disadvantage	Advantage
Initial Government outlay	Advantage	Disadvantage	Advantage
Recurring O&M costs	Disadvantage	Disadvantage	Advantage
Adds to available BOQ units	Disadvantage	Equal to PPV	Equal to MILCON
Insures BOQ units obtainable for 32 years	Disadvantage	Equal to PPV	Equal to MILCON
Time required to implement alternative	Advantage	Disadvantage	Advantage

TABLE 5(A)

LIFE-CYCLE COST CALCULATIONS FOR NEW LONDON MILCON BOQ PROJECT

Years	Year	Inflation rate	Imputed land value	Imputed building value	Construction	Imputed real estate taxes	Total operations costs w/o RE tax	Total operations costs*	Tangible personal property	Total annual costs	Discount factor 9.40	NPV	Cumulative NPV before bldg. disc.	Cumulative NPV
0	1990	1.000	$260,000	$	$4,920,128	$	$	$	$	$5,180,128	1.000	$5,180,128	$5,180,128	$5,180,128
1	1991	1.033	272,609	9,840,255	$4,920,128	0	2,636,676	2,636,676	622,081	8,178,885	0.914	7,476,128	12,656,256	3,412,322
2	1992	1.062	284,445	10,240,611		269,328	1,021,214	1,290,542	0	1,290,542	0.836	1,078,295	13,734,551	4,940,484
3	1993	1.086	295,352	10,262,346		269,900	1,109,394	1,379,294	0	1,379,294	0.764	1,053,428	14,787,979	6,724,596
4	1994	1.106	305,179	10,229,421		269,034	1,129,363	1,398,397	0	1,398,397	0.698	976,250	15,764,229	8,409,803
5	1995	1.126	315,332	10,191,986		268,049	1,149,692	1,417,741	0	1,417,741	0.638	904,712	16,668,941	9,963,841
6	1996	1.146	325,823	10,149,888		266,942	1,170,386	1,437,328	690,175	2,127,503	0.583	1,240,984	17,909,925	11,799,385
7	1997	1.167	336,663	10,102,973		265,708	1,191,453	1,457,161	0	1,457,161	0.533	776,938	18,686,863	13,120,595
8	1998	1.188	347,864	10,051,081		264,343	1,212,899	1,477,243	0	1,477,243	0.487	719,968	19,406,831	14,338,667
9	1999	1.209	359,438	9,994,047		262,843	1,234,731	1,497,575	0	1,497,575	0.445	667,164	20,073,995	15,461,556
10	2000	1.231	371,396	9,931,703		261,204	1,256,957	1,518,160	0	1,518,160	0.407	618,222	20,692,217	16,496,612
11	2001	1.253	383,752	9,863,877		259,420	1,279,582	1,539,002	754,567	2,293,569	0.372	853,731	21,545,948	17,731,490
12	2002	1.276	396,520	9,790,391		257,487	1,302,614	1,560,102	0	1,560,102	0.340	530,817	22,076,766	18,610,717
13	2003	1.299	409,712	9,711,064		255,401	1,326,061	1,581,462	0	1,581,462	0.311	491,851	22,568,617	19,420,951
14	2004	1.322	423,343	9,625,708		253,156	1,349,930	1,603,087	0	1,603,087	0.284	455,737	23,024,354	20,167,536
15	2005	1.346	437,428	9,534,134		250,748	1,374,229	1,624,977	0	1,624,977	0.260	422,267	23,446,621	20,855,407
16	2006	1.370	451,981	9,436,144		248,171	1,398,965	1,647,136	824,967	2,472,103	0.238	587,205	24,033,826	21,685,076
17	2007	1.395	467,018	9,331,538		245,419	1,424,147	1,669,566	0	1,669,566	0.217	362,501	24,396,327	22,268,836
18	2008	1.420	482,556	9,220,108		242,489	1,449,781	1,692,270	0	1,692,270	0.198	335,860	24,732,186	22,806,528
19	2009	1.445	498,611	9,101,644		239,373	1,475,877	1,715,251	0	1,715,251	0.181	311,171	25,043,357	23,301,736
20	2010	1.471	515,200	8,975,928		236,067	1,502,443	1,738,510	0	1,738,510	0.166	288,291	25,331,648	23,757,769
21	2011	1.498	532,340	8,842,736		232,564	1,529,487	1,762,051	901,936	2,663,987	0.152	403,802	25,735,450	24,314,394
22	2012	1.525	550,051	8,701,842		228,858	1,557,018	1,785,876	0	1,785,876	0.139	247,440	25,982,890	24,701,003
23	2013	1.552	568,351	8,552,011		224,944	1,585,044	1,809,988	0	1,809,988	0.127	229,233	26,212,123	25,056,912
24	2014	1.580	587,260	8,296,002		220,815	1,623,575	1,834,390	0	1,834,390	0.116	212,362	26,424,485	25,384,520
25	2015	1.608	606,799	8,230,569		216,464	1,642,619	1,859,083	0	1,859,083	0.106	196,728	26,621,212	25,686,044
26	2016	1.637	626,987	8,056,461		211,855	1,672,187	1,884,071	986,085	2,870,156	0.097	277,623	26,898,835	26,058,908
27	2017	1.667	647,847	7,873,418		207,071	1,702,286	1,909,357	0	1,909,357	0.088	168,818	27,067,653	26,314,235
28	2018	1.697	669,401	7,681,176		202,015	1,732,927	1,934,942	0	1,934,942	0.081	156,381	27,224,034	26,549,147
29	2019	1.727	691,671	7,479,461		196,710	1,764,120	1,960,830	0	1,960,830	0.074	144,856	27,368,890	26,765,248
30	2020	1.759	714,683	7,267,997		191,148	1,795,874	1,987,022	0	1,987,022	0.068	134,179	27,503,069	26,964,019
31	2021	1.790	738,461	7,046,496		185,323	1,826,200	2,013,522	1,078,086	3,091,608	0.062	190,830	27,693,899	27,213,371
32	2022	1.822	$763,030	$6,814,666		$179,226	$1,861,107	$2,040,333	$	$2,040,333	0.056	$115,119	$27,809,018	$27,381,472

* Total operations costs include operations, maintenance, insurance, and imputed real estate taxes.

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TABLE 5(A) (Continued)

LIFE-CYCLE COST CALCULATIONS FOR NEWPORT MILCON BOQ PROJECT

Years	Year	Inflation rate	Imputed land value	Imputed building value	Construction	Imputed real estate taxes	Total operations costs w/o RE tax	Total operations costs*	Tangible personal property	Total annual costs	Discount factor 9.48	NPV	Cumulative NPV before bldg. disc.	Cumulative NPV
0	1990	1.000	$138,000	$9,328,474	$4,664,237	$ 0	$4,218,681	$4,218,681	$622,081	$4,802,237	1.000	$4,802,237	$4,802,237	$4,802,237
1	1991	1.033	144,692	9,708,008	4,664,237	255,321	1,167,100	1,422,421	0	9,504,999	0.914	8,688,299	13,490,536	4,831,335
2	1992	1.062	150,975	9,728,613		255,863	1,267,877	1,523,740	0	1,422,421	0.836	1,188,484	14,679,020	6,441,482
3	1993	1.086	156,764	9,697,400		255,042	1,290,699	1,545,740	0	1,523,740	0.764	1,163,748	15,842,768	8,292,667
4	1994	1.106	161,980	9,661,912		255,108	1,313,931	1,568,040	0	1,545,740	0.698	1,079,114	16,921,881	10,038,841
5	1995	1.126	167,369	9,622,004		254,108	1,337,582	1,590,641	0	1,568,040	0.638	1,000,623	17,922,504	11,650,085
6	1996	1.146	172,937	9,577,529		253,059	1,361,659	1,613,548	690,175	2,280,816	0.583	1,330,412	19,252,917	13,539,474
7	1997	1.167	178,691	9,528,335		251,889	1,386,169	1,636,764	0	1,613,548	0.533	860,321	20,113,238	14,911,358
8	1998	1.188	184,636	9,474,267		250,595	1,411,120	1,660,293	0	1,636,764	0.487	797,714	20,910,952	16,177,113
9	1999	1.209	190,778	9,415,166		249,173	1,436,520	1,684,139	0	1,660,293	0.445	739,654	21,650,607	17,344,864
10	2000	1.231	197,126	9,350,867		247,619	1,462,377	1,708,305	0	1,684,139	0.407	685,811	22,336,418	18,422,121
11	2001	1.253	203,684	9,281,203		245,928	1,488,700	1,732,795	754,567	2,462,872	0.372	916,751	23,253,168	19,696,694
12	2002	1.276	210,461	9,206,002		244,096	1,515,496	1,757,614	0	1,732,795	0.340	589,576	23,842,744	20,613,250
13	2003	1.299	217,463	9,125,086		242,118	1,542,775	1,782,765	0	1,757,614	0.311	546,636	24,389,380	21,458,586
14	2004	1.322	224,698	9,038,274		239,990	1,570,545	1,808,252	0	1,782,765	0.284	506,818	24,896,198	22,238,173
15	2005	1.346	232,173	8,945,381		237,707	1,598,815	1,834,079	0	1,808,252	0.260	469,893	25,366,091	22,957,068
16	2006	1.370	239,898	8,846,215		235,264	1,627,594	1,860,249	824,967	2,659,046	0.238	631,609	25,997,700	23,815,899
17	2007	1.395	247,879	8,740,581		232,655	1,656,891	1,886,768	0	1,860,249	0.217	403,903	26,401,603	24,427,067
18	2008	1.420	256,126	8,628,277		229,877	1,686,715	1,913,638	0	1,886,768	0.198	374,461	26,776,064	24,990,515
19	2009	1.445	264,647	8,509,099		226,924	1,717,075	1,940,865	0	1,913,638	0.181	347,161	27,123,225	25,509,924
20	2010	1.471	273,452	8,382,835		223,789	1,747,983	1,968,451	0	1,940,865	0.166	321,847	27,445,071	25,988,693
21	2011	1.498	282,550	8,249,269		220,469	1,779,446	1,996,402	901,936	2,870,387	0.152	435,088	27,880,159	26,566,677
22	2012	1.525	291,950	8,108,178		216,956	1,811,476	2,024,722	0	1,996,402	0.139	276,609	28,156,768	26,973,349
23	2013	1.552	301,663	7,959,335		213,245	1,844,083	2,053,414	0	2,024,722	0.127	256,429	28,413,197	27,348,100
24	2014	1.580	311,700	7,802,506		209,331	1,877,277	2,082,482	0	2,053,414	0.116	237,717	28,650,915	27,693,403
25	2015	1.608	322,070	7,637,453		205,206	1,911,068	2,111,933	0	2,082,482	0.106	220,368	28,871,282	28,011,541
26	2016	1.637	332,785	7,463,930		200,865	1,945,467	2,141,768	986,085	3,098,018	0.097	299,663	29,170,946	28,400,005
27	2017	1.667	343,857	7,281,686		196,301	1,980,485	2,171,993	0	2,141,768	0.088	189,367	29,360,313	28,669,977
28	2018	1.697	355,297	7,090,463		191,508	2,016,134	2,202,613	0	2,171,993	0.081	175,539	29,535,852	28,918,636
29	2019	1.727	367,118	6,889,996		186,479	2,052,424	2,233,631	0	2,202,613	0.074	162,718	29,698,570	29,147,641
30	2020	1.759	379,332	6,680,015		181,207	2,089,368	2,265,052	0	2,233,631	0.068	150,831	29,849,401	29,358,522
31	2021	1.790	391,952	6,460,243		175,684	2,126,977	2,296,881	1,078,046	3,343,138	0.062	206,356	30,055,757	29,619,238
32	2022	1.822	$404,993	$6,460,243		$169,904	$2,126,977	$2,296,881	$	$2,296,881	0.056	$129,594	$30,185,351	$29,798,003

* Total operations costs include operations, maintenance, insurance, and imputed real estate taxes.

TABLE 5(B)

STATUS QUO AND PPV COSTS TO GOVERNMENT AT NEW LONDON AND NEWPORT

Year	New London Status Quo Expected per diem	New London Status Quo NPV	New London PPV Total cost*	New London PPV NPV	Newport Status Quo Expected per diem	Newport Status Quo NPV	Newport PPV Total cost*	Newport PPV NPV
1990	$2,636,676		$422,280	$422,280			$300,280	$300,280
1991	2,710,503		2,236,046	2,043,918	$4,218,681		2,137,496	1,953,836
1992	2,772,844		2,283,220	1,907,713	4,336,804		2,182,601	1,823,642
1993	2,822,755		2,322,789	1,774,017	4,436,551		2,220,434	1,695,844
1994	2,873,565		2,354,293	1,643,582	4,516,409		2,250,556	1,571,161
1995	2,925,289		2,386,225	1,522,737	4,597,704		2,281,088	1,455,645
1996	2,977,944		2,418,591	1,410,778	4,680,463		2,312,035	1,348,623
1997	3,031,547		2,451,397	1,307,051	4,764,711		2,343,402	1,249,469
1998	3,086,115		2,484,649	1,210,950	4,850,476		2,375,195	1,157,606
1999	3,141,665		2,518,352	1,121,916	4,937,784		2,407,421	1,072,497
2000	3,198,215		2,552,513	1,039,429	5,026,664		2,440,084	993,646
2001	3,255,783		2,587,138	963,006	5,117,144		2,473,191	920,592
2002	3,314,387		2,622,233	892,203	5,209,253		2,506,749	852,909
2003	3,374,046		2,657,806	826,605	5,303,020		2,540,762	790,203
2004	3,434,779		2,693,861	765,831	5,398,474		2,575,238	732,107
2005	3,496,605		2,730,407	709,525	5,495,646		2,610,182	678,283
2006	3,559,544		2,767,449	657,359	5,594,568		2,645,601	628,416
2007	3,623,616		2,804,994	609,028	5,695,270		2,681,501	582,215
2008	3,688,841		2,843,050	564,252	5,797,785		2,717,890	539,411
2009	3,755,240		2,881,623	522,767	5,902,145		2,754,773	499,755
2010	3,822,834		2,920,720	484,332	6,008,384		2,792,158	463,013
2011	3,891,645		2,960,348	448,724	6,116,535		2,830,050	428,973
2012	3,961,645		3,000,515	415,733	6,226,632		2,868,458	397,436
2013	4,003,005		3,041,228	385,168	6,338,712		2,907,388	368,218
2014	4,105,599		3,082,494	356,851	6,452,809		2,946,848	341,147
2015	4,179,500		3,124,321	330,615	6,568,959		2,986,843	316,067
2016	4,254,731		3,166,717	306,308	6,687,200		3,027,383	292,831
2017	4,331,316		3,209,688	283,789	6,807,570		3,068,474	271,303
2018	4,409,280		3,253,244	262,925	6,930,106		3,110,123	251,358
2019	4,488,647		3,297,392	243,595	7,054,848		3,152,339	232,879
2020	4,569,443		3,342,140	225,686	7,181,835		3,195,129	215,759
2021	$4,651,693		3,387,496	209,094	7,311,109		3,238,500	199,897
2022			2,670,440	150,671	$7,442,708		$2,877,469	$162,352
Cumulative NPV		$31.6M		$26.0M		$50.6M		$24.8M

* Total cost includes room/night payments and Government's real and imputed project costs.

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APPENDIX

COST ELEMENT BUILD-UP

INTRODUCTION

This section describes the procedures that we followed in deriving cost items for this economic analysis.

GENERAL

The cost of each alternative is its net present value (NPV), and to determine that NPV, we must first adjust future cash flows for inflation and then discount them. Expenditure flows consist of the cost elements shown in Table 2 in the main text.

Inflation factors used for operations and maintenance (O&M) expenditures are those published by the *Navy Comptroller* as of 13 December 1988 and are as follows:

Fiscal Year	Inflation Rate (percent)
1991	3.3
1992	2.8
1993	2.3
1994-2022	1.8

MILCON COST ELEMENTS

1. *Construction costs.* Data from the DD Forms 1391 submitted by the installations for MILCON projects were used to estimate construction costs (see Table A-1). Construction costs of $74.00 per square foot were used for both New London and Newport. These square foot costs were multiplied by the area cost factors of 1.20 for New London and Ne port. The square foot construction costs and area cost factors were taken from the 10 March 1988 memorandum, "Area Cost Factors and Unit Prices for FY 1990," issued by the Assistant Secretary of Defense for Production and Logistics.

2. *Annual O&M and insurance costs.* The Logistics Management Institute determined annual O&M costs from historical O&M expenditures for BOQs at New London and Newport. Those costs also include the $8.00 per occupied room-night charge to transient officers (paid by officers and reimbursed by Navy O&M travel funds).

3. *Equipment replacement costs.* These costs are based on equipment replacement schedules used by the private sector hotel industry (Source: Pannel, Kerr and Forster, Certified Public Accountants). We assumed that room furnishings would be replaced every 5 years according to private industry practice; that assumption enabled us to maintain proper comparability between MILCON and the PPV alternative.

4. *Imputed real estate taxes.* Equivalent real estate property taxes on the building are estimated to be 2.63 percent, based on actual local property tax rate in New London.

5. *Government lodging allowances.* Government nightly lodging allowances are currently $50 at New London and $80 at Newport. These rates were used to determine the additional O&M costs attributable to the MILCON project being delivered 1 year later than the PPV BOQ alternative.

6. *Terminal value of MILCON buildings.* These values representing the remaining value of the facility at the end of the analysis period are subtracted from the other MILCON costs. A straight-line depreciation rate of 2 percent per year was used, based on *Marshall's Commercial Service* rates for 50-year, Class A, average, hotels.

7. *Imputed land purchase.* Estimated appraisal value according to NAVFAC.

8. *Terminal value of land.* The value at the end of the analysis period of the land used by the BOQ is subtracted from other MILCON costs.

PPV BOQ COST ELEMENTS

1. *Nightly lodging payment.* Estimated cost of lodging paid to developer by occupant.

2. *Government contract management cost.* The cost to the Government of managing the PPV BOQ rental contract is assumed to be $30,000 per year (FY90). This figure is inflated and discounted back to the present.

3. *Government inspection cost.* Estimated to be 2 percent of the MILCON total construction cost estimate.

4. *Imputed land purchase.* Estimated appraisal value according to NAVFAC.

5. *Terminal value of land.* The present value of the land used by the BOQ is subtracted from other PPV costs.

STATUS QUO COST ELEMENTS

Government nightly lodging allowances. The Government nightly lodging allowance, per DoD regulations, is $50 at New London and $80 at Newport. Those rates are multiplied by 150 rooms and then by the assumed 90 percent MILCON/PPV occupancy rates to arrive at the first year's (FY 1991) Status Quo costs.

TABLE A-1

NSB NEW LONDON AND NETC NEWPORT BOQ MILCON CONSTRUCTION ESTIMATES FOR FY90

	New London	Newport
Building cost		
FY90 DoD pricing guide estimate	$74/SF	$74/SF
Area cost factor	- 1.20	1.20
Size of facility[a]	60,300 SF	60,300 SF
Size/unit cost adjustment	0.97	0.97
Building cost = (74)(1.20)(60,300)(0.97)	$5,194,001	$5,194,001
MILCON project cost	($000)	($000)
Building cost (from above)	5,194	5,194
Site support (utilities, pavement, site improvement)	1,236	1,476
Special construction features (rock excavation, retaining walls, piers, and walkways)	1,684	
Special construction features (rock excavation)		1,022
Subtotal	8,114	7,692
Contingencies (5%)	406	385
Total contract cost	8,520	8,077
Supervision, inspection, and overhead (5.5%)	469	444
Design (6% of total contract cost)	511	485
Post-contract award support (4% of total contract cost)	341	323
Total project request	9,841	9,329

[a] The gross building square footage was determined from the 250 net square foot per room multiplied by 1.61 net to gross conversion factor and the number of rooms.

This net to gross conversion factor was based on the original DD Form 1391 estimates downsized to take out kitchens, and reduce room size to that authorized to transients.